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MAR 15 1965

CURRENT SERIAL RECORDS

WATER SUPPLY OUTLOOK
and
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS
for
ARIZONA

UNITED STATES DEPARTMENT of AGRICULTURE--SOIL CONSERVATION SERVICE,
SALT RIVER VALLEY WATER USERS ASSOCIATION
and
ARIZONA AGRICULTURAL EXPERIMENT STATION

Data included in this report were obtained by the agencies
named above in cooperation with the Federal, State and pri-
vate organizations listed on the last page of this report.

||||||| AS OF |||||
MAR. 1, 1965

UNITED STATES DEPARTMENT OF AGRICULTURE - SOIL CONSERVATION SERVICE

To Recipients of Water Supply Outlook Reports:

The climate of the cultivated and populated areas of the West is characterized by relatively dry summer months. Such precipitation as occurs falls mostly in the winter and early spring months when it is of little immediate benefit to growing crops. Most of this precipitation falls as mountain snow which stays on the ground for months, melting later to sustain streamflow during the period of greatest demand during late spring and summer. Thus, nature provides in mountain snow an imposing water storage facility.

The amount of water stored in mountain snow varies from place to place as well as from year to year and accordingly, so does the runoff of the streams. The best seasonal management of variable western water supplies results from advance estimates of the streamflow.

A snow survey consists of a series of about ten samples taken with specially designed snow sampling equipment along a permanently marked line, up to 1000 feet in length, called a snow course. The use of snow sampling equipment provides snow depth and water equivalent values for each sampling point. The average of these values is reported as the snow survey measurement for a snow course.

Snow surveys are made monthly or semi-monthly beginning in January or February and continue through the snow season until April, May or June. Currently more than 1400 western snow courses are measured each year. These measurements furnish the key data for water supply forecasts.

Streamflow forecasts are obtained by a comparison of total or maximum snow accumulation, as measured by snow water equivalent, to the subsequent spring and summer or snowmelt season runoff over a period of years. The snow water equivalent measured in selected snow courses provides most of the index to the streamflow forecast for the following season. More accurate forecasts are usually obtained when other factors such as soil moisture, base flow and spring precipitation are considered and included in the forecast procedure. Early season forecasts assume average climatic conditions through the snowmelt season.

Listed below are the Federal-State-Private Cooperative Snow Survey and Water Supply Forecast reports available for the West which contain detailed information on snow survey measurements, streamflow forecasts, reservoir storage, soil moisture and other guide data to water management and conservation decisions. Soil Conservation Service Reports may be secured from Soil Conservation Service, 511 N.W. Broadway - Room 507, Portland, Oregon 97209.

PUBLISHED BY SOIL CONSERVATION SERVICE

<u>REPORTS</u>	<u>ISSUED</u>	<u>LOCATION</u>	<u>COOPERATING WITH</u>
RIVER BASINS			
WESTERN UNITED STATES	MONTHLY (FEB.-MAY)	PORTLAND, OREGON	ALL COOPERATORS
BASIC DATA SUMMARY	OCTOBER 1	PORTLAND, OREGON	ALL COOPERATORS
STATES			
ALASKA	MONTHLY (MAR.-MAY)	PALMER, ALASKA	ALASKA S.C.D.
ARIZONA	SEMI-MONTHLY (JAN.15 - APR.1)	PHOENIX, ARIZONA	SALT R. VALLEY WATER USERS ASSOC. ARIZ. AGR. EXP. STATION
COLORADO AND NEW MEXICO	MONTHLY (FEB.-MAY)	FORT COLLINS, COLORADO	COLO. STATE UNIVERSITY COLO. STATE ENGINEER N. MEX. STATE ENGINEER
IDAHO	MONTHLY (JAN.-JUNE)	BOISE, IDAHO	IDAHO STATE RECLAMATION ENGINEER
MONTANA	MONTHLY (JAN.-JUNE)	BOZEMAN, MONTANA	MONT. AGR. EXP. STATION
NEVADA	MONTHLY (JAN.-MAY)	RENO, NEVADA	NEVADA DEPT. OF CONSERVATION AND NATURAL RESOURCES DIVISION OF WATER RESOURCES
OREGON	MONTHLY (JAN.-JUNE)	PORTLAND, OREGON	OREG. STATE UNIVERSITY OREGON STATE ENGINEER
UTAH	MONTHLY (JAN.-JUNE)	SALT LAKE CITY, UTAH	UTAH STATE ENGINEER
WASHINGTON	MONTHLY (FEB.-JUNE)	SPOKANE, WASHINGTON	WN. STATE DEPT. OF CONSERVATION
WYOMING	MONTHLY (FEB.-JUNE)	CASPER, WYOMING	WYOMING STATE ENGINEER

PUBLISHED BY OTHER AGENCIES

<u>REPORTS</u>	<u>ISSUED</u>	<u>AGENCY</u>
BRITISH COLUMBIA	MONTHLY (FEB.-JUNE)	WATER RESOURCES SERVICE, DEPT. OF LANDS, FOREST AND WATER RESOURCES, PARLIAMENT BLDG., VICTORIA, B.C., CANADA
CALIFORNIA	MONTHLY (FEB.-MAY)	CALIF. DEPT. OF WATER RESOURCES, P.O. BOX 388, SACRAMENTO, CALIF.

WATER SUPPLY OUTLOOK
and
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS
for
ARIZONA

(Salt, Verde, Gila and Part of Lower Colorado River Basin)

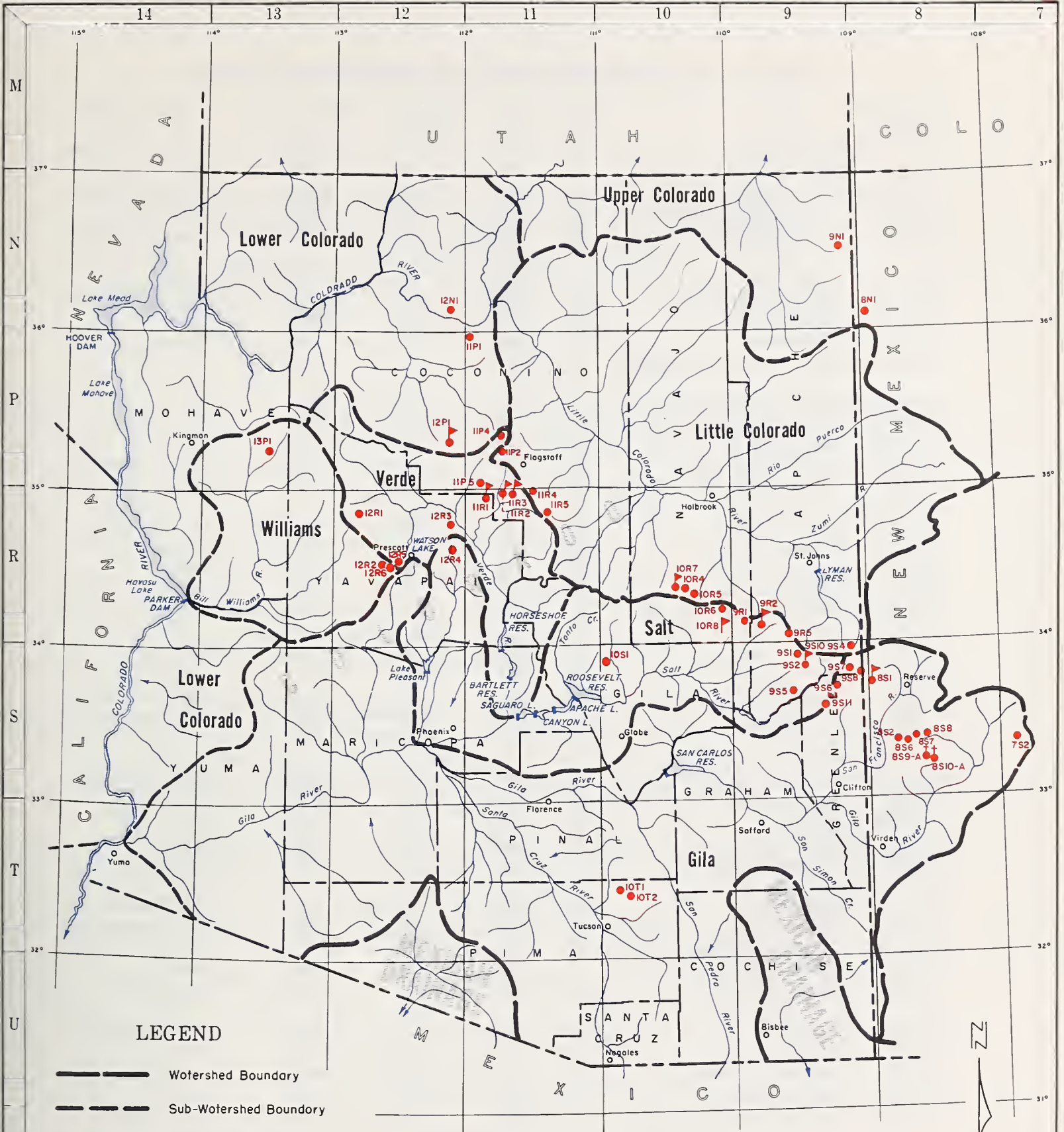
Report prepared by

RICHARD W. ENZ...SNOW SURVEY SUPERVISOR
SOIL CONSERVATION SERVICE
ROOM 6029 FEDERAL BUILDING
PHOENIX, ARIZONA 85025

Issued by

ROBERT V. BOYLE
STATE CONSERVATIONIST
SOIL CONSERVATION SERVICE

VICTOR I. CORBELL
PRESIDENT
SALT RIVER VALLEY WATER USERS ASSOCIATION



ARIZONA COOPERATIVE SNOW SURVEYS Snow Courses and Sub-Watersheds

25 0 25 50 75
SCALE IN MILES

INDEX to SNOW COURSES and SOIL MOISTURE STATIONS

Number**	Name	Sec	Twp	Rge***	Elevation	River Basin
9S1	Baldy (p)	28	7N	27E	9125	Little Colorado
10T1	Bear Wallow	6	12S	16E	8100	Gila
9S6	Beaver Head	13	4N	30E	8000	San Francisco
9S10-*	Black River Divide	10	6N	27E	9400	Salt
12N1	Bright Angel	34	33N	3E	8400	Lower Colorado
12R1	Camp Wood	3	16N	6W	5700	Verde
10R7-M	Canyon Creek #2	18	11N	15E	7500	Little Colorado
11R2-M	Casner Park	19	18N	8E	6930	Verde
12P1-M	Chalender	27	22N	3E	7100	Verde
12R6	Copper Basin Divide(p)	23	13N	3W	6720	Verde
10R8 -*	Corduroy Creek	4	8N	21E	6000	Salt
9S7	Coronado Trail	26	5N	30E	8000	San Francisco
10R6	Forest Dale	2	9N	21E	6430	Salt
11P2	Fort Valley (p)	22	22N	6E	7350	Little Colorado
9R5	Ft. Apache	18	7N	27E	9160	Little Colorado
8S1-M	Frisco Divide	31	6S	20W****	8000	San Francisco
12R4	Gaddes Canyon	11	15N	2E	7600	Verde
10R5	Gentry	36	11N	15E	7650	Salt
11P1	Grand Canyon	21	30N	4E	7500	Lower Colorado
9S11	Hannagan Meadows (p)	19	3N	29E	9090	Salt
11R5	Happy Jack	30	17N	9E	7630	Verde
10R4	Heber (p)	28	11N	15E	7600	Little Colorado
8S9-A	Hummingbird	19	11S	17E	10550	San Francisco
8S6	Ice King	6	11S	18W****	8020	San Francisco
7S2	Inman	6	11S	10W****	7800	Gila
12R2	Iron Springs	22	14N	3W	6200	Bill Williams
9S2	Maverick Fork (p)	13	6N	27E	9150	Salt
9R2-M	McNary	23	8N	23E	7200	Salt
9R1	Milk Ranch	33	8N	23E	7000	Salt
12R3	Mingus Mountain	3	15N	2E	7100	Verde
8S2	Mogollon	2	11S	19W****	7000	San Francisco
11R4	Mormon Lake	13	18N	8E	7350	Little Colorado
11R3-M	Mormon Mountain (p)	14	18N	8E	7500	Verde
11R1-M	Munds Park	7	18N	7E	6500	Verde
11P5-M	Newman Park	25	19N	6E	6750	Verde
9S4	Nutriso	23	6N	30E	8500	San Francisco
9S5	Pacheta	27	4-1/2N	27E	7800	Salt
8S7	Redstone Trail	5	11S	18W****	8600	San Francisco
10T2	Rose Canyon	15	12S	16E	7300	Gila
8S8	Silver Creek Divide	4	11S	18W****	9000	San Francisco
11P4	Snow Bowl (p)	36	23N	6E	10260	Verde
9S8	State Line	6	6S	21W****	8000	San Francisco
12R5	White Spar	19	13N	2W	6000	Verde
8S10-A	Whitewater	19	11S	17E	10750	Gila
13P1	Willow Ranch	16	21N	11W	5000	Bill Williams
10S1	Workman Creek	33	6N	14E	6900	Salt

* SOIL MOISTURE STATION ONLY

** NUMBER INDICATES LOCATION OF SNOW COURSE WITHIN COORDINATE RECTANGLE.
THUS 9N1 IS COURSE #1 IN COORDINATE RECTANGLE 9N.

*** ALL IN GILA AND SALT RIVER BASIN AND MARIQUAN EXCEPT WHERE OTHERWISE INDICATED.

**** NEW MEXICO PRINCIPAL MARIQUAN

M SOIL MOISTURE STATION INSTALLED ON OR IN VICINITY OF SNOW COURSE.

(p) STORAGE GAGE INSTALLED ON OR IN VICINITY OF SNOW COURSE.

A AERIAL SNOW DEPTH GAGE

ARIZONA WATER SUPPLY OUTLOOK

MARCH 1, 1965

* * * * *
* The Water Supply Outlook for most of Arizona is good. *
* Reservoir Storage is above average and runoff prospects *
* are also expected to be better than average. Only the *
* Upper Gila Valley and San Carlos Project may expect *
* below average runoff. *
* * * * *

SNOW COVER: The snow pack has generally declined since the last survey as no significant precipitation has occurred and temperatures were warm enough to cause melting. The Gila Watershed in New Mexico received a good snowfall that missed Arizona; snow cover there is 30% above average. The Salt River Watershed has 19% above the average amount of snow for March 1, but on the Verde River Watershed, snow cover is 31% below average.

Above 9000' in the White Mountains the snow pack is 58% above average. The deep powder snow of two weeks ago has settled, but the water content shows very little melting. The deepest snow measured was at the Whitewater aerial marker where there is 72" of snow containing 16.2" of water.

PRECIPITATION: Above average precipitation was received during February at all mountain stations. Most of this occurred the first week of February, and precipitation in Arizona has been negligible since. Western New Mexico, however, received a good storm late in the month. Precipitation since November generally runs from 35% to 50% above average on the major watersheds.

SOIL MOISTURE: Soil moisture continues to be very good generally. Surface drying is taking place at the lower elevations as a result of the warm windy days we've been having the last half of the month. Good runoff may be expected from the present snow pack and additional storms.

RESERVOIR STORAGE: Storage in all Arizona Reservoirs is now above average for this date except Lake Pleasant. Stored water increased 143,000 acre feet during February in the Salt River Project Reservoirs. They contain 6% above average storage and are 47% of capacity. Storage in San Carlos Reservoir is slightly above average, but is only 6% of capacity. Most small reservoirs are full or contain substantially above average amounts of water. Lyman Reservoir and Watson Lake should come close to filling this year. The Colorado River Reservoirs presently contain 3% above average water in storage. The prospects for a very good spring runoff, however, will raise this substantially.

STREAMFLOW AND WATER SUPPLY: Streamflow was above average on all major streams in Arizona last month. Forecasts for the March through May period are above average on all streams except on the Gila River where 15% below average is expected. The combined flow of the Salt, Verde, and Tonto Rivers is predicted to be 27% above average. The Little Colorado River above Lyman Reservoir is forecast to flow over twice its normal flow for the March through June period.

Water supplies should be adequate in Arizona with the exception of the San Carlos Project; some pumping will be required there. In many areas water supplies will be adequate for some carry-over storage for next year.

STREAM FLOW FORECASTS - MARCH 1, 1965

The following summarized runoff forecasts are based principally on mountain snow cover and on the assumption that precipitation and temperature will be near average from the present time to the end of the forecast period. Appreciable deviations from normal of temperature and/or precipitation will correspondingly modify these forecasts.

SUB-WATERSHED, STREAM and STATION	SEASONAL STREAM FLOW IN THOUSANDS OF ACRE FEET					
	FORECAST PERIOD: MARCH - MAY, INCLUSIVE					
	Forecast	Percent	Measured Runoff			1948-62
	Runoff	15-Year				Average
	1965	Average	1964	1963	1962	
Salt River at Intake	316	139	93.2	120.0	417.0	226.4
Tonto River above Roosevelt	29	114	9.6	3.6	37.6	25.4
Verde River above Horseshoe	120	106	90.1	29.9	134.6	113.7
Gila River near Gila	31	87	12.0	23.7	49.6	35.5
Gila River near Virden	33	83	10.3	25.7	62.7	39.7
Gila River near Solomon	65	84	17.1	50.0	124.0	77.7
Frisco River near Glenwood	14.5	84	---	7.1	29.2	17.3
Frisco River at Clifton	34	84	10.0	24.8	59.1	40.5
Little Colorado River above Lyman Dam (MAR.-JUNE, Incl.)	19	218	4.5	1.9	24.5	8.7
Gila River near Solomon (Month of March)	34	88	6.6	22.1	36.8	38.7

The Gila River near Solomon is forecast to flow above 100 cfs until May 14.

Granite Creek is forecast to flow 1300 Acre Feet; Watson Lake should come very close to filling this year.

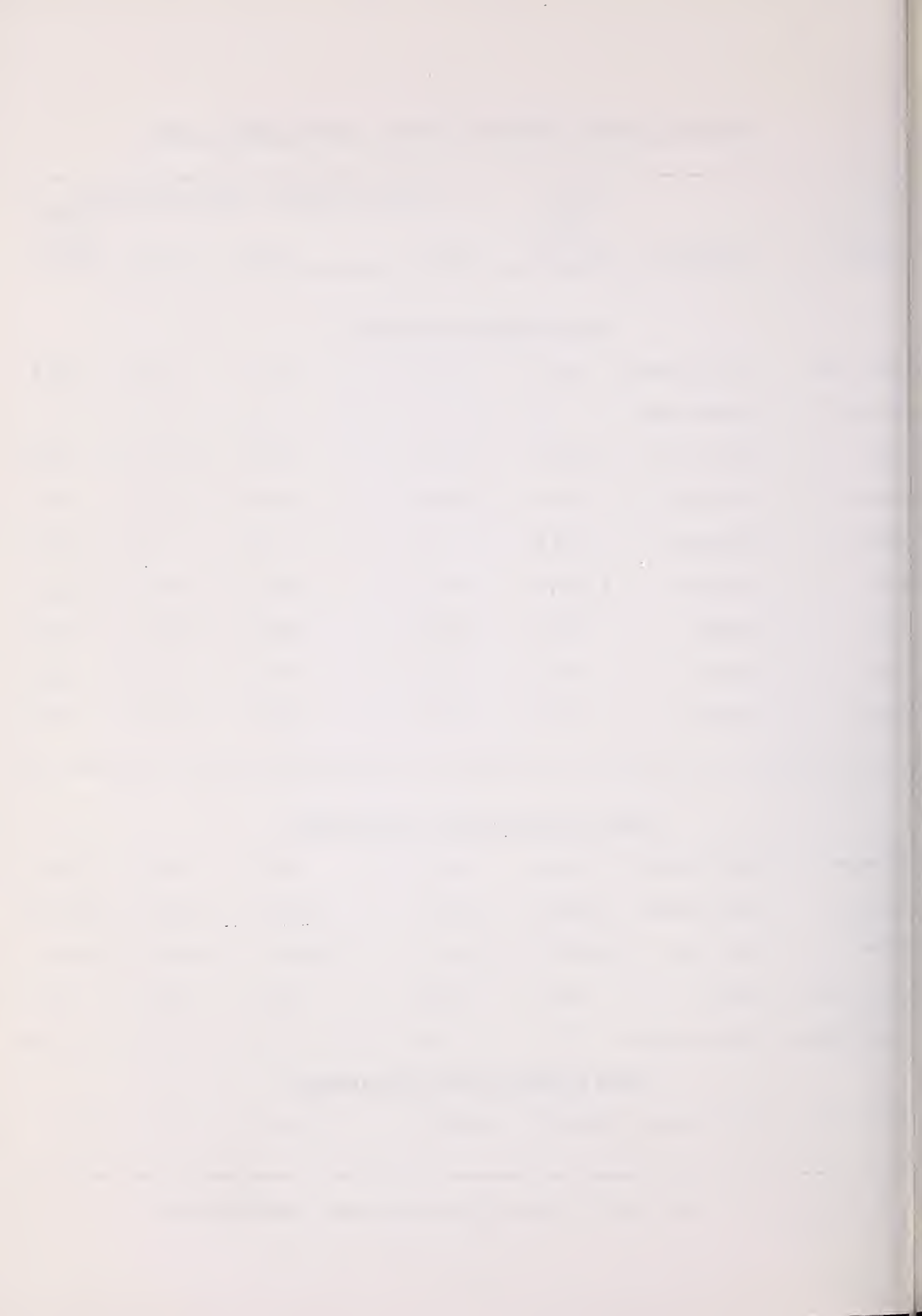
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NAME		ADDRESS		CITY		STATE		COUNTRY	

STATUS OF ARIZONA RESERVOIR STORAGE - ABOUT MARCH 1, 1965

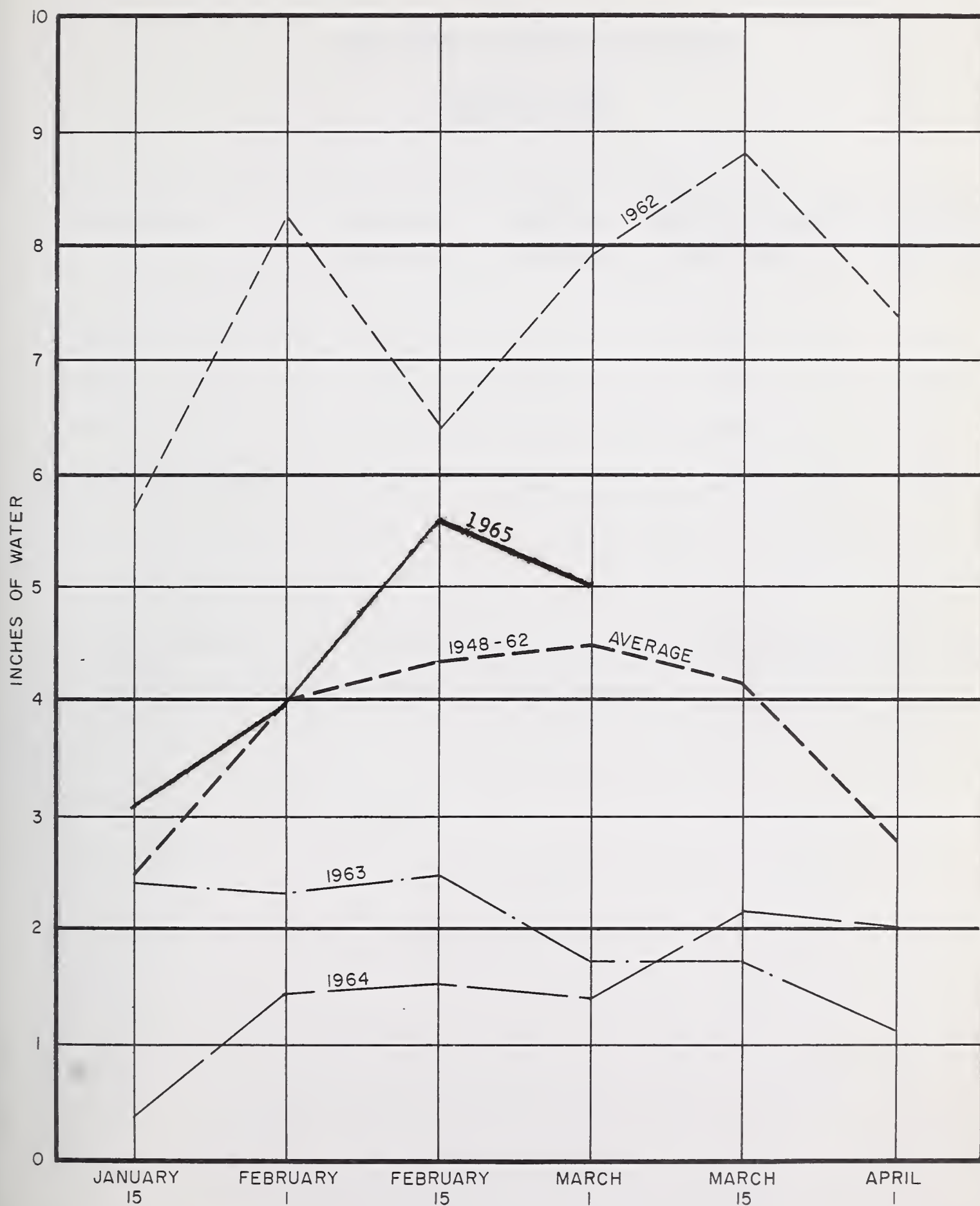
SUB- WATERSHED and/or STREAM	RESERVOIR	USABLE CAPACITY 1000s AC. FT.	USABLE STORAGE - 1000s ACRE FEET			
			1965	1964	1963	15-Year Average 1948-62
<u>GILA RIVER SUB-WATERSHED</u>						
Agua Fria	Lake Pleasant	163.8	26.2	16.0	2.8	30.7
Granite	Watson Lake	4.7	3.3	3.9	0.7	---
Gila	San Carlos	1,206.0	75.1	63.2	131.7	74.4
Verde	Bartlett	179.5	143.2	17.8	20.8	79.3
Verde	Horseshoe	142.8	7.8	1.5	1.5	25.2
Salt	Roosevelt	1,382.0	472.2	420.3	708.9	426.3
Salt	Apache	245.0	232.1	239.6	231.7	203.6
Salt	Canyon	58.0	51.6	55.2	53.4	48.7
Salt	Saguaro	70.0	65.4	65.0	66.5	53.1
<u>LOWER COLORADO RIVER SUB-WATERSHED</u>						
Colorado	Lake Havasu	619.4	517.5	539.6	518.6	546.5
Colorado	Lake Mohave	1,810.0	1,682.9	1,674.0	1,699.0	1,566.2*
Colorado	Lake Mead	27,207.0	11,361.0	15,090.0	22,497.0	17,036.1
Little Colo.	Lyman	30.6	10.8	10.5	13.5	7.3
Little Colo.	Show Low Lake	5.1	3.0	0.8	1.7	1.3*
<u>UPPER COLORADO RIVER SUB-WATERSHED</u>						
Colorado	Lake Powell	28.040.0	6,223.3	3,119.0	---	---

* Average is for less than 15 years of record in the 1948-62 period.



RELATIVE SNOW WATER ACCUMULATION ARIZONA

MARCH 1, 1965



This graph represents the average snow water content on eleven selected snow courses on Arizona Sub-Watersheds.

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SNOW COVER ON ARIZONA WATERSHEDS

MARCH 1, 1965

Watershed	No. of Courses Average	Water Content of Snow	This Year's Water Content of Snow Expressed as Percent of:	
			Last Year	Average *
Gila	8	3.6	454	130
Salt	14	4.9	326	119
Verde	11	2.3	570	69
Little Colorado	5	6.1	469	133

* Actual or Estimated 1948-62, 15-year Average.

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1900

NAME		RESIDENCE		DATE	
1	100	100	100	100	100
2	100	100	100	100	100
3	100	100	100	100	100
4	100	100	100	100	100

THE UNIVERSITY OF CHICAGO

MARCH 1, 1965



SNOW ABOUT MARCH 1, 1965

DRAINAGE BASIN and SNOW COURSE			CURRENT INFORMATION			PAST RECORD	
			DATE OF SURVEY	SNOW DEPTH (Inches)	WATER CONTENT (Inches)	WATER CONTENT (Inches)	
NAME	NO.	ELEVATION				LAST YEAR	AVERAGE ^a
GILA RIVER							
Bear Wallow	10T1	8100	2/28	13	4.0	0.3	3.5
Beaver Head	9S6	8000	2/27	7	2.1	0.4	2.8
Coronado Trail	9S7	8000	2/26	12	5.6	0.4	2.5
Frisco Divide	8S1-M	8000	3/1	7	2.9	0.7	2.1
Hummingbird #2. (A)	8S9-A	10550	2/26	47	15.2	---	---
Ice King	8S6	8020	2/26	23	6.3	3.4	---
Inman	7S2	7800	2/26	4	1.0	0.0	0.4
Mogollon	8S2	7000	2/26	12	2.6	1.1	2.0 **
Nutrioso	9S4	8500	2/26	9	3.7	0.7	1.9
Redstone Trail	8S7	8600	2/26	29	9.1	2.8	---
Rose Canyon	10T2	7300	2/28	11	2.9	0.0	1.5
Silver Creek Divide	8S8	9000	2/26	41	13.4	3.8	---
State Line	9S8	8000	3/1	5	2.1	0.3	2.2
Whitewater (A)	8S10-A	10750	2/26	72	16.2	6.8	---
SALT RIVER							
Baldy *	9S1	9125	2/26	38	11.5	2.8	8.9 **
Beaver Head	9S6	8000	2/27	7	2.1	0.4	2.8
Canyon Creek #2	10R7-M	7500	2/25	10	3.1	2.4	3.5 **
Coronado Trail	9S7	8000	2/26	12	5.6	0.4	2.5
Forest Dale	10R6	6430	2/26	2	0.8	T	0.7
Ft. Apache *	9R5	9160	2/26	40	11.9	3.1	9.5 **
Gentry	10R5	7600	2/25	7	2.3	2.4	3.4 **
Hannagan Meadows	9S11	9090	2/27	40	11.9	4.0	---
Heber	10R4	7600	2/25	10	3.1	2.2	3.6 **
Maverick Fork	9S2	9050	2/26	43	13.8	3.4	10.8 **
McNary	9R2-M	7200	2/26	10	2.7	T	2.1
Milk Ranch	9R1	7000	2/26	4	1.6	0.0	1.0
Nutrioso *	9S4	8500	2/26	9	3.7	0.7	1.9
Pacheta	9S5	7800	2/26	5	2.0	0.0	3.4 **
Workman Creek	10S1	6900	2/25	12	4.3	3.1	3.6 **
VERDE RIVER							
Camp Wood	12R1	5700	2/26	0	0.0	0.0	0.9
Casner Park	11R2-M	6930	2/24	6	1.6	0.0	3.2 **
Chalender	12P1-M	7100	2/25	8	2.4	1.0	3.2
Copper Basin Divide	12R6	6720	2/26	2	0.7	0.0	---
Fort Valley	11P2	7350	2/26	5	1.6	0.0	2.6
Gaddes Canyon	12R4	7600	2/26	22	6.7	0.6	5.3 **
Happy Jack	11R5	7630	2/27	9	3.5	0.0	4.4 **
Iron Springs *	12R2	6200	2/26	0	0.0	0.0	1.1
Mingus Mountain	12R3	7100	2/26	T	T	0.0	1.2
Mormon Lake *	11R4	7350	2/24	11	3.3	1.7	4.9
Mormon Mountain	11R3-M	7500	2/24	14	4.5	1.3	7.2 **
Munds Park	11R1-M	6500	2/23	5	1.5	0.0	2.7 **
Newman Park	11P5-M	6750	2/23	3	0.9	0.0	---
Snow Bowl #1	11P4	10260	2/23	39	12.3	2.5	---
Snow Bowl #2	11P6	11000	2/28	55	17.2	---	---
White Spar	12R5	6000	2/26	0	0.0	0.0	---

(a) 1948-62, 15 year period. (*) Adjacent drainage. (**) 1948-62 Adjusted Average. (A) Aerial observation: Water content estimated.

Section 1							Notes
Item	Qty	Unit	Material	Price	Total	Remarks	
1	10	m	Steel Pipe	12.50	125.00		
2	5	m	Steel Pipe	12.50	62.50		
3	15	m	Steel Pipe	12.50	187.50		
4	20	m	Steel Pipe	12.50	250.00		
5	10	m	Steel Pipe	12.50	125.00		
6	5	m	Steel Pipe	12.50	62.50		
7	15	m	Steel Pipe	12.50	187.50		
8	20	m	Steel Pipe	12.50	250.00		
9	10	m	Steel Pipe	12.50	125.00		
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11	15	m	Steel Pipe	12.50	187.50		
12	20	m	Steel Pipe	12.50	250.00		
13	10	m	Steel Pipe	12.50	125.00		
14	5	m	Steel Pipe	12.50	62.50		
15	15	m	Steel Pipe	12.50	187.50		
16	20	m	Steel Pipe	12.50	250.00		
17	10	m	Steel Pipe	12.50	125.00		
18	5	m	Steel Pipe	12.50	62.50		
19	15	m	Steel Pipe	12.50	187.50		
20	20	m	Steel Pipe	12.50	250.00		
21	10	m	Steel Pipe	12.50	125.00		
22	5	m	Steel Pipe	12.50	62.50		
23	15	m	Steel Pipe	12.50	187.50		
24	20	m	Steel Pipe	12.50	250.00		
25	10	m	Steel Pipe	12.50	125.00		
26	5	m	Steel Pipe	12.50	62.50		
27	15	m	Steel Pipe	12.50	187.50		
28	20	m	Steel Pipe	12.50	250.00		
29	10	m	Steel Pipe	12.50	125.00		
30	5	m	Steel Pipe	12.50	62.50		
31	15	m	Steel Pipe	12.50	187.50		
32	20	m	Steel Pipe	12.50	250.00		
33	10	m	Steel Pipe	12.50	125.00		
34	5	m	Steel Pipe	12.50	62.50		
35	15	m	Steel Pipe	12.50	187.50		
36	20	m	Steel Pipe	12.50	250.00		
37	10	m	Steel Pipe	12.50	125.00		
38	5	m	Steel Pipe	12.50	62.50		
39	15	m	Steel Pipe	12.50	187.50		
40	20	m	Steel Pipe	12.50	250.00		
41	10	m	Steel Pipe	12.50	125.00		
42	5	m	Steel Pipe	12.50	62.50		
43	15	m	Steel Pipe	12.50	187.50		
44	20	m	Steel Pipe	12.50	250.00		
45	10	m	Steel Pipe	12.50	125.00		
46	5	m	Steel Pipe	12.50	62.50		
47	15	m	Steel Pipe	12.50	187.50		
48	20	m	Steel Pipe	12.50	250.00		
49	10	m	Steel Pipe	12.50	125.00		
50	5	m	Steel Pipe	12.50	62.50		
51	15	m	Steel Pipe	12.50	187.50		
52	20	m	Steel Pipe	12.50	250.00		
53	10	m	Steel Pipe	12.50	125.00		
54	5	m	Steel Pipe	12.50	62.50		
55	15	m	Steel Pipe	12.50	187.50		
56	20	m	Steel Pipe	12.50	250.00		
57	10	m	Steel Pipe	12.50	125.00		
58	5	m	Steel Pipe	12.50	62.50		
59	15	m	Steel Pipe	12.50	187.50		
60	20	m	Steel Pipe	12.50	250.00		
61	10	m	Steel Pipe	12.50	125.00		
62	5	m	Steel Pipe	12.50	62.50		
63	15	m	Steel Pipe	12.50	187.50		
64	20	m	Steel Pipe	12.50	250.00		
65	10	m	Steel Pipe	12.50	125.00		
66	5	m	Steel Pipe	12.50	62.50		
67	15	m	Steel Pipe	12.50	187.50		
68	20	m	Steel Pipe	12.50	250.00		
69	10	m	Steel Pipe	12.50	125.00		
70	5	m	Steel Pipe	12.50	62.50		
71	15	m	Steel Pipe	12.50	187.50		
72	20	m	Steel Pipe	12.50	250.00		
73	10	m	Steel Pipe	12.50	125.00		
74	5	m	Steel Pipe	12.50	62.50		
75	15	m	Steel Pipe	12.50	187.50		
76	20	m	Steel Pipe	12.50	250.00		
77	10	m	Steel Pipe	12.50	125.00		
78	5	m	Steel Pipe	12.50	62.50		
79	15	m	Steel Pipe	12.50	187.50		
80	20	m	Steel Pipe	12.50	250.00		
81	10	m	Steel Pipe	12.50	125.00		
82	5	m	Steel Pipe	12.50	62.50		
83	15	m	Steel Pipe	12.50	187.50		
84	20	m	Steel Pipe	12.50	250.00		
85	10	m	Steel Pipe	12.50	125.00		
86	5	m	Steel Pipe	12.50	62.50		
87	15	m	Steel Pipe	12.50	187.50		
88	20	m	Steel Pipe	12.50	250.00		
89	10	m	Steel Pipe	12.50	125.00		
90	5	m	Steel Pipe	12.50	62.50		
91	15	m	Steel Pipe	12.50	187.50		
92	20	m	Steel Pipe	12.50	250.00		
93	10	m	Steel Pipe	12.50	125.00		
94	5	m	Steel Pipe	12.50	62.50		
95	15	m	Steel Pipe	12.50	187.50		
96	20	m	Steel Pipe	12.50	250.00		
97	10	m	Steel Pipe	12.50	125.00		
98	5	m	Steel Pipe	12.50	62.50		
99	15	m	Steel Pipe	12.50	187.50		
100	20	m	Steel Pipe	12.50	250.00		

SNOW

ABOUT MARCH 1, 1965

DRAINAGE BASIN and SNOW COURSE			CURRENT INFORMATION			PAST RECORD	
NAME	NO.	ELEVATION	DATE OF SURVEY	SNOW DEPTH (Inches)	WATER CONTENT (Inches)	WATER CONTENT (Inches)	
						LAST YEAR	AVERAGE ^a

BILL WILLIAMS RIVER

Camp Wood *	12R1	5700	2/26	0	0.0	0.0	0.9
Copper Basin Divide	12R6	6720	2/26	2	0.7	0.0	---
Iron Springs	12R2	6200	2/26	0	0.0	0.0	1.1
Willow Ranch	13P1	5000	3/1	0	0.0	0.0	0.4

LOWER COLORADO RIVER

Bright Angel	12N1	8400	No	Survey		---	9.6 **
Chalender *	12P1-M	7100	2/25	8	2.4	1.0	3.2
Fort Valley	11P2	7350	2/26	5	1.6	0.0	2.6
Grand Canyon	11P1	7500	2/26	5	1.6	0.0	2.2

LITTLE COLORADO RIVER

Baldy	9S1	9125	2/26	38	11.5	2.8	8.9 **
Canyon Creek #2	10R7-M	7500	2/25	10	3.1	2.4	3.5 **
Forest Dale	10R6	6430	2/26	2	0.8	T	0.7
Ft. Apache	9R5	9160	2/26	40	11.9	3.1	9.5 **
Fort Valley	11P2	7350	2/26	5	1.6	0.0	2.6
Gentry	10R5	7600	2/25	7	2.3	2.4	3.4 **
Happy Jack *	11R5	7630	2/27	9	3.5	0.0	4.4 **
Heber	10R4	7600	2/25	10	3.1	2.2	3.6 **
McNary	9R2-M	7200	2/26	10	2.7	T	2.1
Mormon Lake	11R4	7350	2/24	11	3.3	1.7	4.9
Mormon Mountain	11R3-M	7500	2/24	14	4.5	1.3	7.2 **
Nutriososo	9S4	8500	2/26	9	3.7	0.7	1.9
Snow Bowl #1	11P4	10260	2/23	39	12.3	2.5	---
Snow Bowl #2	11P6	11000	2/28	55	17.2	---	---

DELAYED REPORT RECEIVED SINCE LAST BULLETIN - FEBRUARY 15:

Camp Wood	12R1	5700	2/13	4	1.2		
-----------	------	------	------	---	-----	--	--

(a) 1948-62, 15 year period. (*) Adjacent drainage. (**) 1948-62 Adjusted Average. (A) Aerial observation: Water content estimated.

PRECIPITATION

STORAGE GAGE DATA - ABOUT MARCH 1, 1965

Drainage Basin and Storage Gage	Elev.	Current Data		1948-62	From Approx. 11/1 to Date		
		Date of Reading	February Precip.	Avg. Feb. Precip.	This Year	1948-62 Average	% of Average
<u>GILA RIVER</u>							
Silver Creek Divide	9000	2/26	5.60	--	15.61	--	---
Hannagan Meadows	9030	2/27	3.69	2.02*	14.17	10.53*	135
<u>SALT RIVER</u>							
Hannagan Meadows	9030	2/27	3.69	2.02*	14.17	10.53*	135
Little Wildcat (Heber Snow Course)	7600	2/25	2.83	2.75*	14.76#	10.97*	135
Maverick Fork	9050	2/26	2.58	2.34*	14.26	9.21*	155
Workman Creek ^{1/}	6970	2/25	3.80	2.84	16.44	13.54	121
<u>VERDE RIVER</u>							
Copper Basin Divide	6720	2/26	3.02	--	9.96	--	---
Fort Valley ^{1/}	7350	2/26	2.12	1.86	7.98	7.16	111
Happy Jack ^{1/}	7480	2/27	2.65	2.05*	13.28#	9.15*	145
Mingus Mountain	7660	2/26	3.04	2.11	9.81	8.00	123
Mormon Mountain	7500	2/24	3.42	--	16.28	--	---
<u>LITTLE COLORADO</u>							
Sheep Crossing (Baldy Snow Course)	9125	2/26	2.69	2.12*	12.62	8.35*	151
Little Wildcat	7600	2/25	2.83	2.75*	14.76#	10.97*	135

^{1/} Data supplied by U. S. Forest Service

* 1948-62 Adjusted Average

Partially Estimated.



ARIZONA SOIL MOISTURE - ABOUT MARCH 1, 1965

Drainage Basin and Station	<u>1/</u> Station Number	Elev.	Soil Profile in Inches		Soil Moisture Content in Inches				
			Depth	Cap.	Date	1965	Past Record		
							1964	1963	Avg.
<u>GILA RIVER</u>									
Frisco Divide	8S1-M	8000	48	13.3	3/1	11.7	5.6	11.6	11.2
<u>SALT RIVER</u>									
Black River Divide	9S10-*	9100	48	16.8	2/26	17.9	15.3	15.9	15.2
Canyon Creek #2	10R7-M	7500	48	18.3	2/25	14.7	14.1	13.7	14.3
Corduroy Creek	10R8-*	6000	48	16.0	2/25	12.2	6.5	10.9	9.1
McNary	9R2-M	7200	48	16.3	2/26	17.9	13.3	15.1	13.9
<u>VERDE RIVER</u>									
Casner Park	11R2-M	6930	48	19.1	2/24	20.6	11.4	18.3	14.6
Mormon Mountain	11R3-M	7500	48	16.1	2/24	17.7	13.3	17.7	14.7

1/* - Soil Moisture Station only
M - Snow Course and Soil Moisture Station



LIST OF SNOW SURVEYORS

<u>SNOW COURSE</u>	<u>SURVEYOR</u>
Baldy -----	SCS and SRVWUA
Bear Wallow -----	Forest Service - Allan Hinds
Beaver Head -----	N. A. Josh
Bright Angel -----	National Park Service - Vern Ruesch
Camp Wood -----	Lyn Pehl
Canyon Creek #2 -----	SCS and SRVWUA
Casner Park -----	SCS and SRVWUA
Chalender -----	Forest Service - Mel Richards
Copper Basin Divide -----	SCS - Bill Gray
Coronado Trail -----	Forest Service - Larry Soehlig
Forest Dale -----	Fort Apache Reservation - Raymond Endfield
Ft. Apache -----	SCS and SRVWUA
Fort Valley -----	Rocky Mountain Forest & Range Exp. Station
Frisco Divide -----	Forest Service - Joe Clayton
Gaddes Canyon -----	Paul G. Lidbeck
Gentry -----	SCS and SRVWUA
Grand Canyon -----	National Park Service - Larry Hackel
Hannagan Meadows -----	N. A. Josh
Happy Jack -----	Emil O. Ryberg
Heber -----	SCS and SRVWUA
Hummingbird -----	Ray Freeman
Ice King -----	James R. Wray
Inman -----	C. H. McCauley
Iron Springs -----	SCS - Bill Gray
Maverick Fork -----	SCS and SRVWUA
McNary -----	Fort Apache Reservation - Raymond Endfield
Milk Ranch -----	Fort Apache Reservation - Raymond Endfield
Mingus Mountain -----	Paul G. Lidbeck
Mogollon -----	James R. Wray
Mormon Lake -----	SCS and SRVWUA
Mormon Mountain -----	SCS and SRVWUA
Munds Park -----	SCS and SRVWUA
Newman Park -----	SCS and SRVWUA
Nutrioso -----	Forest Service - Larry Soehlig
Pacheta -----	Foch Phillips
Redstone Trail -----	James R. Wray
Rose Canyon -----	Forest Service - Allan Hinds
Silver Creek Divide -----	James R. Wray
Snow Bowl -----	Forest Service - Jay Shoemaker
State Line -----	Forest Service - Joe Clayton
White Spar -----	SCS - Bill Gray
Whitewater -----	Ray Freeman
Willow Ranch -----	Tiny Miller
Workman Creek -----	Rocky Mountain Forest & Range Exp. Station

The Following Organizations Cooperate in the Arizona Snow Survey Work

FEDERAL

Department of Agriculture

Soil Conservation Service

Forest Service

Apache Forest

Coconino Forest

Coronado Forest

Gila Forest

Kaibab Forest

Prescott Forest

Rocky Mountain Forest and Range Experiment Station

Tonto Forest

Department of Commerce

Weather Bureau

Arizona Section

Department of Interior

Bureau of Reclamation

Region III

Geological Survey

Arizona District

Bureau of Indian Affairs

Fort Apache Reservation

San Carlos Irrigation Project

National Park Service

Grand Canyon National Park

Gila Water Commissioner

Safford, Arizona

STATE

Arizona Agricultural Experiment Station

IRRIGATION PROJECTS

Salt River Valley Water Users' Association

Phoenix, Arizona

San Carlos Irrigation and Drainage District

Coolidge, Arizona

PRIVATE

Southwest Forest Industries, Inc.

McNary, Arizona

Other organizations and individuals furnish valuable information for the snow survey reports. Their cooperation is gratefully acknowledged.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ROOM 6029 FEDERAL BUILDING
PHOENIX, ARIZONA 85025

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FEDERAL - STATE - PRIVATE
COOPERATIVE SNOW SURVEYS

Furnishes the basic data
necessary for forecasting
water supply for irrigation,
domestic and municipal water
supply, hydro-electric power
generation, navigation,
mining and industry

*"The Conservation of Water begins
with the Snow Survey"*



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MAR 21 1965

CURRENT SERIAL RECORDS

WATER SUPPLY OUTLOOK and **FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS** for **ARIZONA**

UNITED STATES DEPARTMENT of AGRICULTURE...SOIL CONSERVATION SERVICE,
SALT RIVER VALLEY WATER USERS ASSOCIATION
and
ARIZONA AGRICULTURAL EXPERIMENT STATION

Data included in this report were obtained by the agencies
named above in cooperation with the Federal, State and pri-
vate organizations listed on the last page of this report.

AS OF
MAR. 15, 1965

UNITED STATES DEPARTMENT OF AGRICULTURE - SOIL CONSERVATION SERVICE

To Recipients of Water Supply Outlook Reports:

The climate of the cultivated and populated areas of the West is characterized by relatively dry summer months. Such precipitation as occurs falls mostly in the winter and early spring months when it is of little immediate benefit to growing crops. Most of this precipitation falls as mountain snow which stays on the ground for months, melting later to sustain streamflow during the period of greatest demand during late spring and summer. Thus, nature provides in mountain snow an imposing water storage facility.

The amount of water stored in mountain snow varies from place to place as well as from year to year and accordingly, so does the runoff of the streams. The best seasonal management of variable western water supplies results from advance estimates of the streamflow.

A snow survey consists of a series of about ten samples taken with specially designed snow sampling equipment along a permanently marked line, up to 1000 feet in length, called a snow course. The use of snow sampling equipment provides snow depth and water equivalent values for each sampling point. The average of these values is reported as the snow survey measurement for a snow course.

Snow surveys are made monthly or semi-monthly beginning in January or February and continue through the snow season until April, May or June. Currently more than 1400 western snow courses are measured each year. These measurements furnish the key data for water supply forecasts.

Streamflow forecasts are obtained by a comparison of total or maximum snow accumulation, as measured by snow water equivalent, to the subsequent spring and summer or snowmelt season runoff over a period of years. The snow water equivalent measured in selected snow courses provides most of the index to the streamflow forecast for the following season. More accurate forecasts are usually obtained when other factors such as soil moisture, base flow and spring precipitation are considered and included in the forecast procedure. Early season forecasts assume average climatic conditions through the snowmelt season.

Listed below are the Federal-State-Private Cooperative Snow Survey and Water Supply Forecast reports available for the West which contain detailed information on snow survey measurements, streamflow forecasts, reservoir storage, soil moisture and other guide data to water management and conservation decisions. Soil Conservation Service Reports may be secured from Soil Conservation Service, 511 N.W. Broadway - Room 507, Portland, Oregon 97209.

PUBLISHED BY SOIL CONSERVATION SERVICE

<u>REPORTS</u>	<u>ISSUED</u>	<u>LOCATION</u>	<u>COOPERATING WITH</u>
RIVER BASINS			
WESTERN UNITED STATES	MONTHLY (FEB.-MAY)	PORTLAND, OREGON	ALL COOPERATORS
BASIC DATA SUMMARY	OCTOBER 1	PORTLAND, OREGON	ALL COOPERATORS
STATES			
ALASKA	MONTHLY (MAR.-MAY)	PALMER, ALASKA	ALASKA S.C.D.
ARIZONA	SEMI-MONTHLY (JAN.15 - APR.1)	PHOENIX, ARIZONA	SALT R. VALLEY WATER USERS ASSOC. ARIZ. AGR. EXP. STATION
COLORADO AND NEW MEXICO	MONTHLY (FEB.-MAY)	FORT COLLINS, COLORADO	COLO. STATE UNIVERSITY COLO. STATE ENGINEER N. MEX. STATE ENGINEER
IDAHO	MONTHLY (JAN.-JUNE)	BOISE, IDAHO	IDAHO STATE RECLAMATION ENGINEER
MONTANA	MONTHLY (JAN.-JUNE)	BOZEMAN, MONTANA	MONT. AGR. EXP. STATION
NEVADA	MONTHLY (JAN.-MAY)	RENO, NEVADA	NEVADA DEPT. OF CONSERVATION AND NATURAL RESOURCES DIVISION OF WATER RESOURCES
OREGON	MONTHLY (JAN.-JUNE)	PORTLAND, OREGON	OREG. STATE UNIVERSITY OREGON STATE ENGINEER
UTAH	MONTHLY (JAN.-JUNE)	SALT LAKE CITY, UTAH	UTAH STATE ENGINEER
WASHINGTON	MONTHLY (FEB.-JUNE)	SPOKANE, WASHINGTON	WN. STATE DEPT. OF CONSERVATION
WYOMING	MONTHLY (FEB.-JUNE)	CASPER, WYOMING	WYOMING STATE ENGINEER

PUBLISHED BY OTHER AGENCIES

<u>REPORTS</u>	<u>ISSUED</u>	<u>AGENCY</u>
BRITISH COLUMBIA	MONTHLY (FEB.-JUNE)	WATER RESOURCES SERVICE, DEPT. OF LANDS, FOREST AND WATER RESOURCES, PARLIAMENT BLDG., VICTORIA, B.C., CANADA
CALIFORNIA	MONTHLY (FEB.-MAY)	CALIF. DEPT. OF WATER RESOURCES, P.O. BOX 388, SACRAMENTO, CALIF.

WATER SUPPLY OUTLOOK
and
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS
for
ARIZONA

(Salt, Verde, Gila and Part of Lower Colorado River Basin)

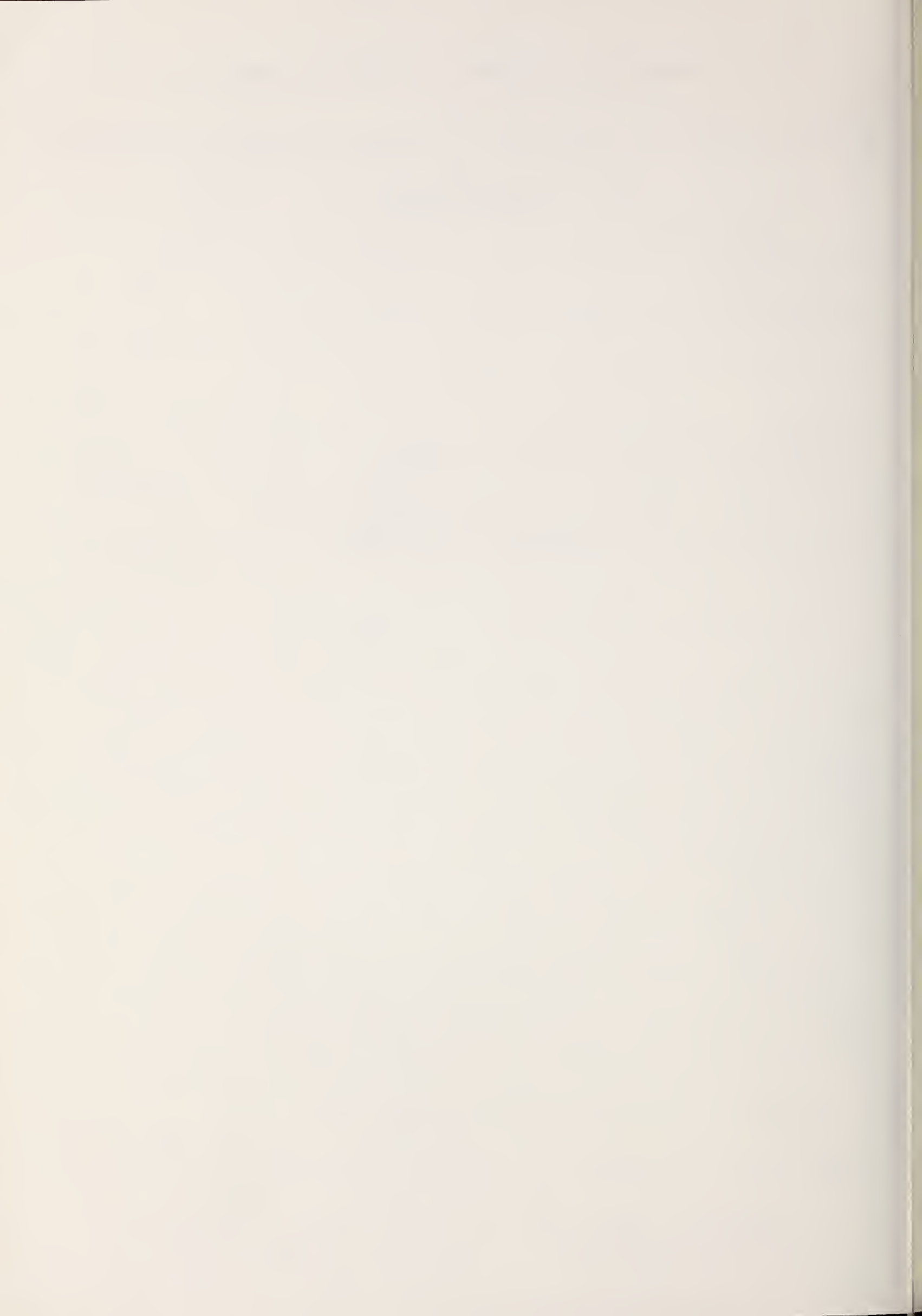
Report prepared by

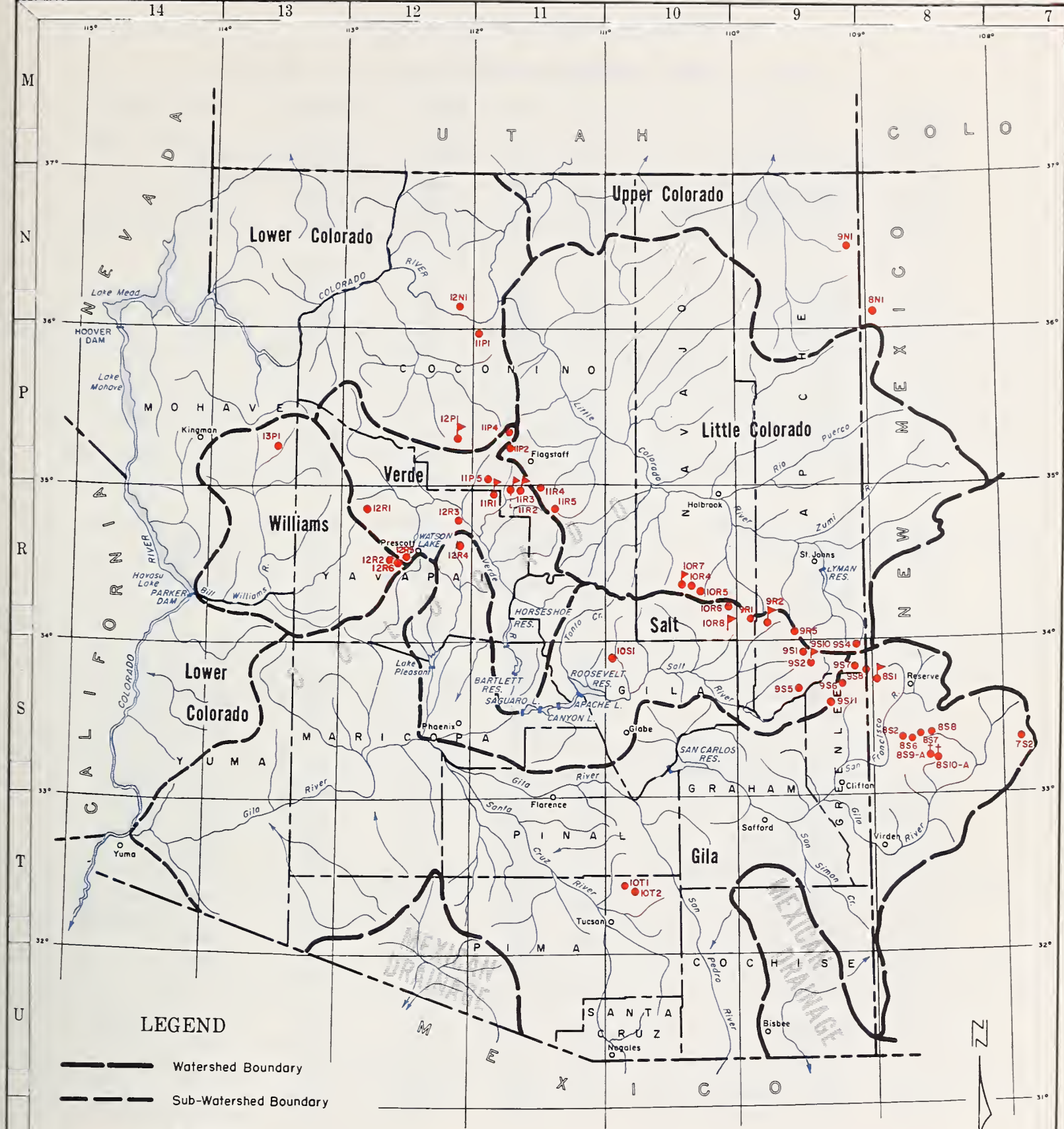
RICHARD W. ENZ...SNOW SURVEY SUPERVISOR
SOIL CONSERVATION SERVICE
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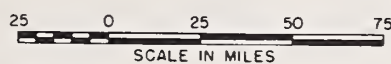
ROBERT V. BOYLE
STATE CONSERVATIONIST
SOIL CONSERVATION SERVICE

VICTOR I. CORBELL
PRESIDENT
SALT RIVER VALLEY WATER USERS ASSOCIATION





ARIZONA
COOPERATIVE SNOW SURVEYS
Snow Courses and Sub-Watersheds



INDEX to SNOW COURSES and SOIL MOISTURE STATIONS

Number**	Name	Sec	Twp	Rge***	Elevation	River Basin
9S1	Baldy (p)	28	7N	27E	9125	Little Colorado
10T1	Bear Wallow	6	12S	16E	8100	Gila
9S6	Beaver Head	13	4N	30E	8000	San Francisco
9S10-*	Black River Divide	10	6N	27E	9400	Salt
12N1	Bright Angel	34	33N	3E	8400	Lower Colorado
12R1	Camp Wood	3	16N	6W	5700	Verde
10R7-M	Canyon Creek #2	18	11N	15E	7500	Little Colorado
11R2-M	Casner Park	19	18N	8E	6930	Verde
12P1-M	Chalender	27	22N	3E	7100	Verde
12R6	Copper Basin Divide(p)	23	13N	3W	6720	Verde
10R8 -*	Corduroy Creek	4	8N	21E	6000	Salt
9S7	Coronado Trail	26	5N	30E	8000	San Francisco
10R6	Forest Dale	2	9N	21E	6430	Salt
11P2	Fort Valley (p)	22	22N	6E	7350	Little Colorado
9R5	Ft. Apache	18	7N	27E	9160	Little Colorado
8S1-M	Frisco Divide	31	6S	20W****	8000	San Francisco
12R4	Gaddes Canyon	11	15N	2E	7600	Verde
10R5	Gentry	36	11N	15E	7650	Salt
11P1	Grand Canyon	21	30N	4E	7500	Lower Colorado
9S11	Hannagan Meadows (p)	19	3N	29E	9090	Salt
11R5	Happy Jack	30	17N	9E	7630	Verde
10R4	Heber (p)	28	11N	15E	7600	Little Colorado
8S9-A	Hummingbird	19	11S	17E	10550	San Francisco
8S6	Ice King	6	11S	18W****	8020	San Francisco
7S2	Inman	6	11S	10W****	7800	Gila
12R2	Iron Springs	22	14N	3W	6200	Bill Williams
9S2	Maverick Fork (p)	13	6N	27E	9150	Salt
9R2-M	McNary	23	8N	23E	7200	Salt
9R1	Milk Ranch	33	8N	23E	7000	Salt
12R3	Mingus Mountain	3	15N	2E	7100	Verde
8S2	Mogollon	2	11S	19W****	7000	San Francisco
11R4	Mormon Lake	13	18N	8E	7350	Little Colorado
11R3-M	Mormon Mountain (p)	14	18N	8E	7500	Verde
11R1-M	Munds Park	7	18N	7E	6500	Verde
11P5-M	Newman Park	25	19N	6E	6750	Verde
9S4	Nutriso	23	6N	30E	8500	San Francisco
9S5	Pacheta	27	4-1/2N	27E	7800	Salt
8S7	Redstone Trail	5	11S	18W****	8600	San Francisco
10T2	Rose Canyon	15	12S	16E	7300	Gila
8S8	Silver Creek Divide	4	11S	18W****	9000	San Francisco
11P4	Snow Bowl (p)	36	23N	6E	10260	Verde
9S8	State Line	6	6S	21W****	8000	San Francisco
12R5	White Spar	19	13N	2W	6000	Verde
8S10-A	Whitewater	19	11S	17E	10750	Gila
13P1	Willow Ranch	16	21N	11W	5000	Bill Williams
10S1	Workman Creek	33	6N	14E	6900	Salt

* SOIL MOISTURE STATION ONLY

** NUMBER INDICATES LOCATION OF SNOW COURSE WITHIN COORDINATE RECTANGLE.
THUS 9N1 IS COURSE #1 IN COORDINATE RECTANGLE 9N.

*** ALL IN GILA AND SALT RIVER BASE AND MERIDIAN EXCEPT WHERE OTHERWISE
INDICATED.

**** NEW MEXICO PRINCIPAL MERIDIAN

M SOIL MOISTURE STATION INSTALLED ON OR IN VICINITY OF SNOW COURSE.

(p) STORAGE GAGE INSTALLED ON OR IN VICINITY OF SNOW COURSE.

A AERIAL SNOW DEPTH GAGE

ARIZONA WATER SUPPLY OUTLOOK

MARCH 15, 1965

* * * * *
* The Water Supply Outlook for Arizona is generally good.*
* Reservoir Storage is up and Streamflow is expected to *
* be above average this spring. Only along the Gila *
* River are water supplies expected to be below average. *
* * * * *

SNOW COVER: The First good storm in over a month deposited substantial amounts of snow on Arizona Watersheds last week. Heaviest snowfall occurred near Long Valley about ten miles north of Pine where 24" of new snow containing 4" of water was measured March 14; total snow depth there is 34" with 9.4 inches of water. Elsewhere, the snowfall varied from 6" to 18". Snow cover is above average on all watersheds ranging from 110% of average on the Verde to 138% of average on the Little Colorado River Watershed.

The water content at the aerial snow depth markers in the Gila Wilderness was checked on the ground last week. Whitewater snow course at elevation 10,750' with a depth of 79" contains 23.4 inches of water.

PRECIPITATION: Above average precipitation has been received so far in March due to the recent storm; between one and three inches has been recorded at most stations on the Watershed. Since November 1, total precipitation has been 30% above average as measured at mountain stations.

SOIL MOISTURE: Soil moisture is very good on all Watersheds. Surface soils are now wet again so the entire profile is at field capacity or close to it. Good runoff may be anticipated from the present snow pack and subsequent precipitation.

RESERVOIR STORAGE: Combined storage of the Salt River Project Reservoirs on March 15, was 1,027,165 Acre Feet; this is 118% of the 1948-62 fifteen-year average, and 50% of capacity.

All major reservoirs contain above average amounts of water except San Carlos, which is only slightly below. Watson Lake and Lynx Lake near Prescott are expected to fill this year. In the White Mountains, Luna Reservoir, Nelson Reservoir, the Greer Lakes, Rainbow Lake, and Daggs Reservoir, are all full. Show Low Lake has been getting good runoff, but filling is slow due to pumping. Lyman Reservoir contains 50% above average stored water for this date, but it will not quite fill this year.

STREAMFLOW AND WATER SUPPLY: Streamflow forecasts are above average by 44%, 6%, and 107%, on the Salt, Verde, and Little Colorado Rivers, respectively. The Gila River is forecast to flow 85% of average. Streamflow was much above average on the Salt, Verde, and Tonto streams so far this month, with 90,600 Acre Feet of water being produced. This raises the total received since January 1, to 484,000 Acre Feet. With an additional 390,000 Acre Feet of runoff expected by the end of May, this would be 57% above average for the January-May period.

Water supplies will be adequate with carry-over storage available on most projects. The only exceptions are on the San Carlos Project and the project served by Lake Pleasant; pumping will be required there as usual.

Although water supplies are generally good, farmers are urged to practice good irrigation water management to save as much water as possible for carry-over and reduce ground water depletion.

STREAM FLOW FORECASTS - MARCH 15, 1965

The following summarized runoff forecasts are based principally on mountain snow cover and on the assumption that precipitation and temperature will be near average from the present time to the end of the forecast period. Appreciable deviations from normal of temperature and/or precipitation will correspondingly modify these forecasts.

SUB-WATERSHED, STREAM and STATION	SEASONAL STREAM FLOW IN THOUSANDS OF ACRE FEET					
	FORECAST PERIOD: MARCH - MAY, INCLUSIVE					
	Forecast Runoff 1965	Percent 15-Year Average	Measured Runoff			1948-62 Average
			1964	1963	1962	
Salt River at Intake	325	144	93.2	120.0	417.0	226.4
Tonto River above Roosevelt	39	153	9.6	3.6	37.6	25.4
Verde River above Horseshoe	120	106	90.1	29.9	134.6	113.7
Gila River near Gila	32	90	12.0	23.7	49.6	35.5
Gila River near Virden	34	86	10.3	25.7	62.7	39.7
Gila River near Solomon	66	85	17.1	50.0	124.0	77.7
Frisco River near Glenwood	15	87	---	7.1	29.2	17.3
Frisco River at Clifton	34	84	10.0	24.8	59.1	40.5
Little Colorado River above Lyman Dam (MAR.-JUNE, Incl.)	18	207	4.5	1.9	24.5	8.7
Gila River near Solomon (Month of March)	35	90	6.6	22.1	35.8	38.7

The Gila River near Solomon is forecast to remain above 100 cfs until May 15.

Granite Creek is forecast to flow 900 Acre Feet; this will fill Watson Lake.

THE HISTORY OF THE

REIGN OF
HIS MOST EXCELLENT MAJESTY
CHARLES THE FIRST
BY
JAMES HALLAM, ESQ.

LONDON:
Printed by J. Sturges, at the Angel in St. Dunstons Church-yard, 1719.

THE HISTORY OF THE
REIGN OF
HIS MOST EXCELLENT MAJESTY
CHARLES THE FIRST
BY
JAMES HALLAM, ESQ.

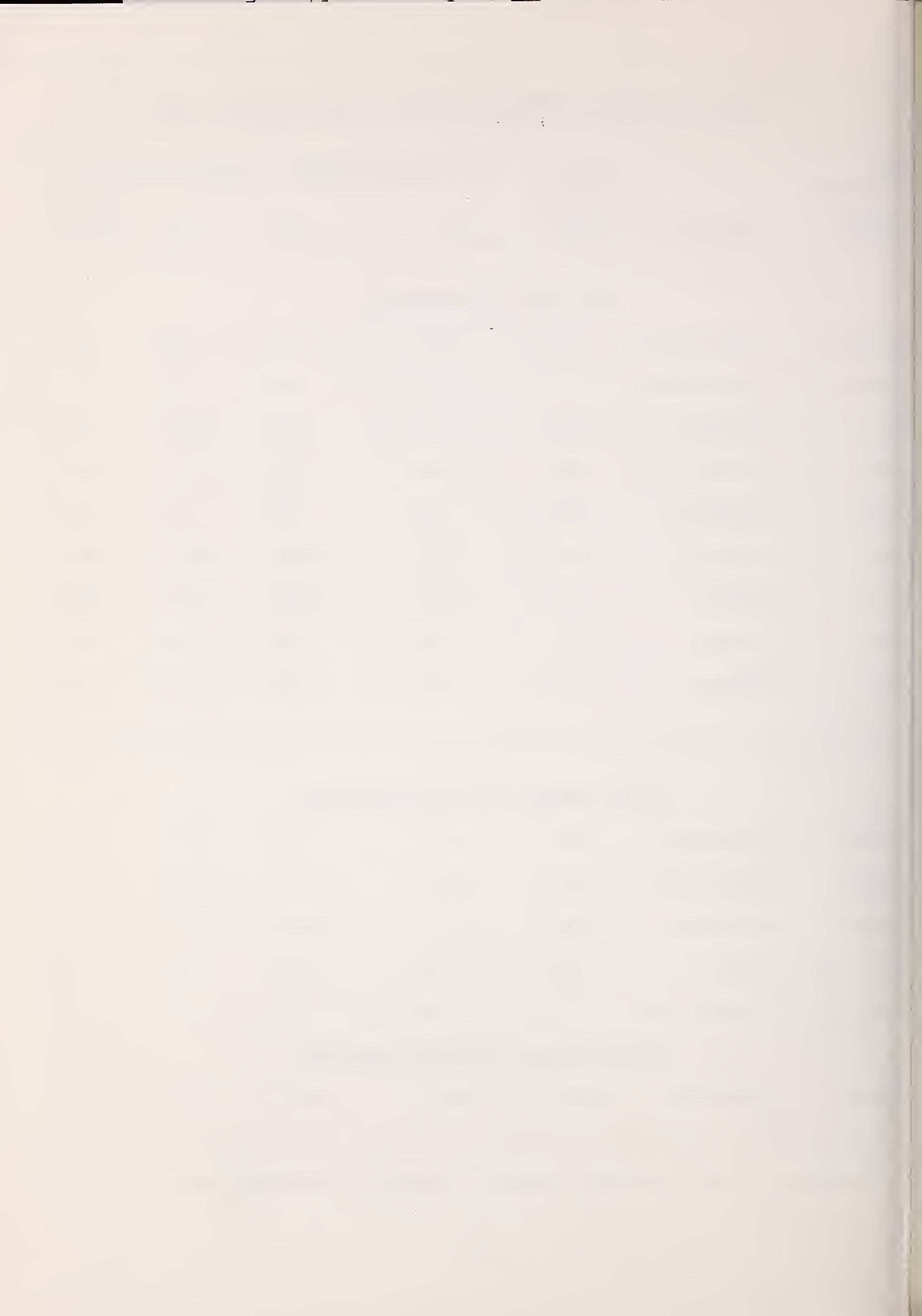
LONDON:
Printed by J. Sturges, at the Angel in St. Dunstons Church-yard, 1719.

THE HISTORY OF THE
REIGN OF
HIS MOST EXCELLENT MAJESTY
CHARLES THE FIRST
BY
JAMES HALLAM, ESQ.

STATUS OF ARIZONA RESERVOIR STORAGE - ABOUT MARCH 15, 1965

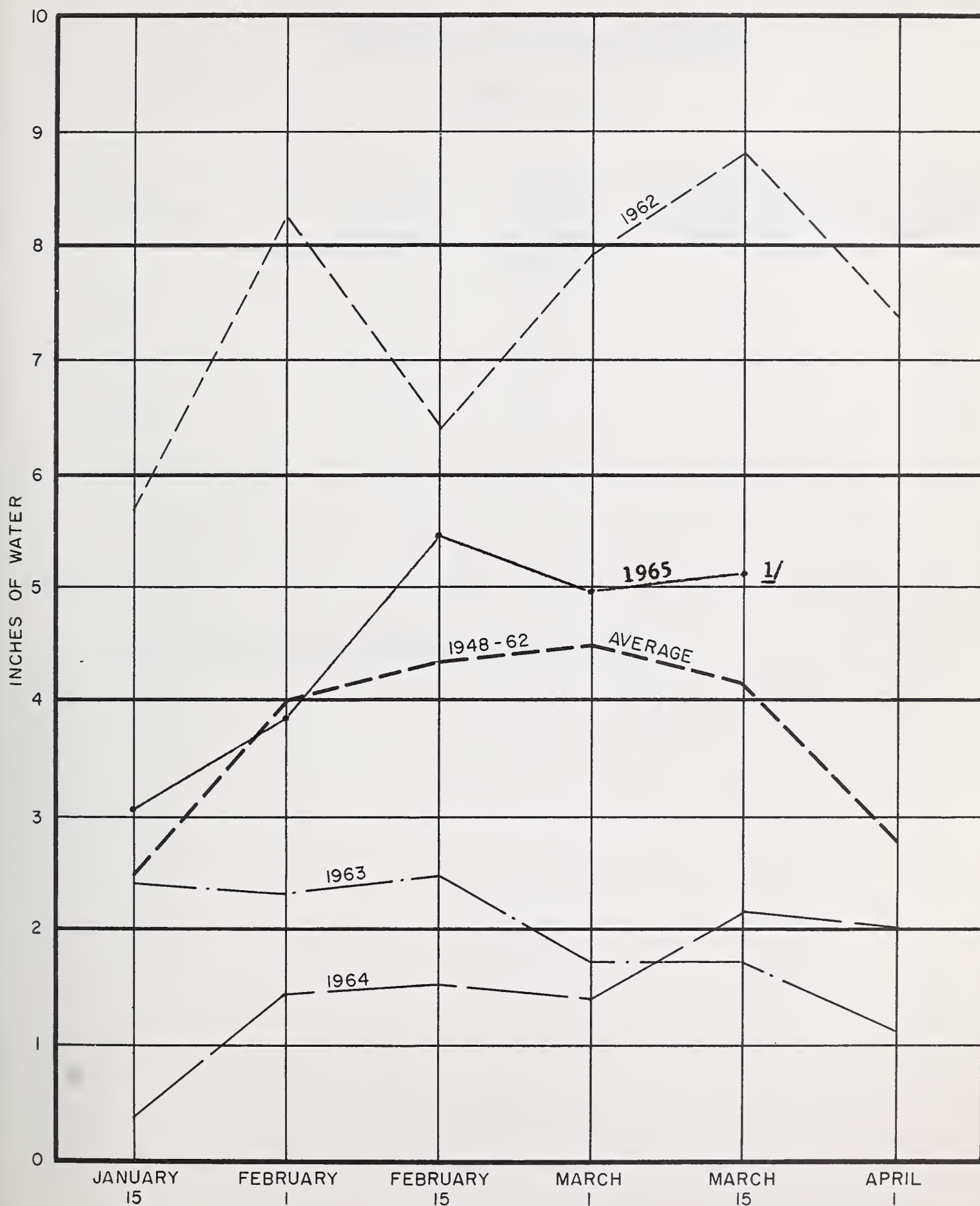
SUB- WATERSHED and/or STREAM	RESERVOIR	USABLE CAPACITY 1000s AC. FT.	USABLE STORAGE - 1000s ACRE FEET			
			1965	1964	1963	15-Year Average 1948-62
<u>GILA RIVER SUB-WATERSHED</u>						
Agua Fria	Lake Pleasant	163.8	31.9	15.9	2.8	31.9
Granite	Watson Lake	4.7	3.5	3.9	0.7	---
Gila	San Carlos	1,206.0	76.8	60.2	128.3	79.1
Verde	Bartlett	179.5	149.0	22.2	24.7	84.4
Verde	Horseshoe	142.8	5.6	1.6	1.4	27.5
Salt	Roosevelt	1,382.0	522.1	400.7	700.1	443.5
Salt	Apache	245.0	233.1	242.0	229.2	208.6
Salt	Canyon	58.0	53.4	55.5	53.8	48.7
Salt	Saguaro	70.0	63.8	65.8	65.2	54.8
<u>LOWER COLORADO RIVER SUB-WATERSHED</u>						
Colorado	Lake Havasu	619.4	550.1	539.3	532.3	550.1
Colorado	Lake Mohave	1,810.0	1,687.8	1,701.0	1,724.0	1,579.7*
Colorado	Lake Mead	27,207.0	11,217.0	14,851.0	22,555.0	16,825.1
Little Colo.	Lyman	30.6	11.4	10.7	13.5	7.6
Little Colo.	Show Low Lake	5.1	3.5	0.8	1.8	1.4*
<u>UPPER COLORADO RIVER SUB-WATERSHED</u>						
Colorado	Lake Powell	25,002.0	6,224.9	3,122.0	125.8	---

* Average is for less than 15 years of record in the 1948-62 period.



RELATIVE SNOW WATER ACCUMULATION ARIZONA

MARCH 15, 1965



1/ The March 15 point is partially estimated since some of the snow courses were measured before the storm was concluded.
 This graph represents the average snow water content on eleven selected snow courses on Arizona Sub-Watersheds.

1. Introduction 2. Methodology 3. Results 4. Discussion 5. Conclusion



The graph shows the relationship between Time and Value. The line starts at a low value, rises to a peak, and then falls. The peak is labeled 'Peak'.

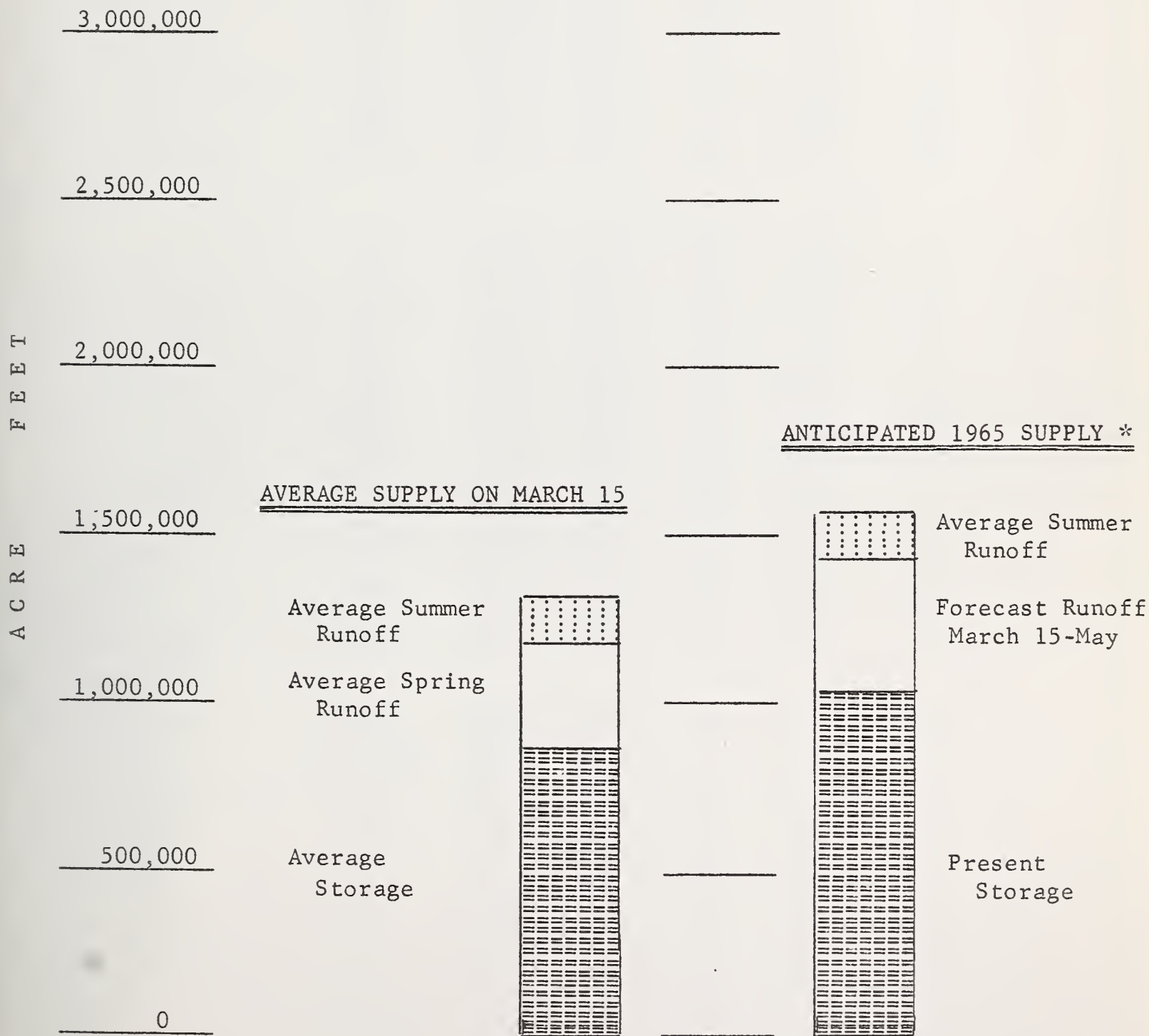
SNOW COVER ON ARIZONA WATERSHEDS

MARCH 15, 1965

Watershed	No. of Courses Average	Water Content of Snow (Inches)	This Year's Water Content of Snow Expressed as percent of:	
			Last Year	Average *
Gila	8	2.7	294	115
Salt	14	4.9	223	132
Verde	11	3.2	317	110
Little Colorado	5	5.9	270	138

* Actual or Estimated 1948-62, 15-year Average.

WATER SUPPLY INVENTORY
SALT RIVER VALLEY SYSTEM
MARCH 15, 1965



* Based on present Storage + Forecast Spring runoff + Average Summer runoff.



SNOW ABOUT MARCH 15, 1965

DRAINAGE BASIN and SNOW COURSE			CURRENT INFORMATION			PAST RECORD	
			DATE OF SURVEY	SNOW DEPTH (Inches)	WATER CONTENT (Inches)	WATER CONTENT (Inches)	
NAME	NO.	ELEVATION				LAST YEAR	AVERAGE ^a

GILA RIVER

Bear Wallow	10T1	8100	3/12	16	5.3	2.1	2.8
Beaver Head	9S6	8000	3/13	6	1.8	1.3	2.5
Coronado Trail	9S7	8000	3/12	11	4.3	0.3	2.1
Frisco Divide	8S1-M	8000	3/15	6	2.5	0.9	1.6
Hummingbird #2 (A)	8S9-A	10550	3/12	61	20.4	---	---
Ice King	8S6	8020	3/10	22	6.9	3.7	---
Inman	7S2	7800	3/12	T	T	0.0	0.4
Mogollon	8S2	7000	3/10	T	T	0.2	1.6 **
Nutrioso	9S4	8500	3/12	6	2.2	0.7	1.4
Redstone Trail	8S7	8600	3/10	27	8.3	3.9	---
Rose Canyon	10T2	7300	3/12	6	1.4	0.9	1.1
Silver Creek Divide	8S8	9000	3/10	40	11.8	5.2	---
State Line	9S8	8000	3/15	4	2.0	0.0	1.5
Whitewater (A)	8S10-A	10750	3/12	79	23.4	9.0	---

SALT RIVER

Baldy *	9S1	9125	3/10	33	11.0	4.4	8.7 **
Beaver Head	9S6	8000	3/13	6	1.8	1.3	2.5
Canyon Creek #2	10R7-M	7500	3/11	9	2.0	3.4	2.6 **
Coronado Trail	9S7	8000	3/12	11	4.3	0.3	2.1
Forest Dale	10R6	6430	3/12	2	0.5	T	0.4
Ft. Apache *	9R5	9160	3/10	35	10.9	4.4	9.6 **
Gentry	10R5	7600	3/11	7	0.9	2.8	2.4 **
Hannagan Meadows	9S11	9090	3/13	45	12.4	5.6	---
Heber	10R4	7600	3/11	10	2.4	2.7	2.5 **
Maverick Fork	9S2	9050	3/10	39	13.1	4.7	11.3 **
McNary	9R2-M	7200	3/12	12	2.4	1.6	1.5
Milk Ranch	9R1	7000	3/12	8	1.5	0.5	0.8
Nutrioso *	9S4	8500	3/12	6	2.2	0.7	1.4
Pacheta	9S5	7800	3/15	5	2.0	0.0	2.8 **
Workman Creek	10S1	6900	3/11	14	3.8	4.1	3.6 **

VERDE RIVER

Camp Wood	12R1	5700	3/12	5	1.7	0.6	0.4
Casner Park	11R2-M	6930	3/12	15	2.3	1.5	3.0 **
Chalender	12P1-M	7100	3/12	11	2.6	1.4	2.8
Copper Basin Divide	12R6	6720	3/12	12	1.9	0.2	---
Fort Valley	11P2	7350	3/13	9	1.3	0.7	2.1
Gaddes Canyon	12R4	7600	3/12	30	7.2	1.4	6.2 **
Happy Jack	11R5	7630	3/15	15	3.9	0.0	3.2 **
Iron Springs *	12R2	6200	3/12	6	1.1	0.0	0.7
Mingus Mountain	12R3	7100	3/12	7	0.9	0.0	0.7
Mormon Lake *	11R4	7350	3/12	19	3.5	2.7	4.4
Mormon Mountain	11R3-M	7500	3/12	23	4.5	2.9	6.4 **
Munds Park	11R1-M	6500	No	Survey		0.0	2.2 **
Newman Park	11P5-M	6750	3/12	9	2.1	0.8	---
Snow Bowl #1	11P4	10260	3/14	49	13.0	3.8	---
Snow Bowl #2	11P6	11000	3/14	64	13.8	---	---
White Spar	12R5	6000	3/12	8	1.5	0.0	---

(a) 1948-62, 15 year period. (*) Adjacent drainage. (**) 1948-62 Adjusted Average. (A) Aerial observation: Water content estimated.

SNOW ABOUT MARCH 15, 1965

DRAINAGE BASIN and SNOW COURSE			CURRENT INFORMATION			PAST RECORD	
			DATE OF SURVEY	SNOW DEPTH (Inches)	WATER CONTENT (Inches)	WATER CONTENT (Inches)	
NAME	NO.	ELEVATION				LAST YEAR	AVERAGE ^a

BILL WILLIAMS RIVER

Camp Wood *	12R1	5700	3/12	5	1.7	0.6	0.4
Copper Basin Divide	12R6	6720	3/12	12	1.9	0.2	---
Iron Springs	12R2	6200	3/12	6	1.1	0.0	0.7
Willow Ranch	13P1	5000	3/15	0	0.0	0.0	0.1

LOWER COLORADO RIVER

Bright Angel	12N1	8400	No	Survey		5.2	10.2 **
Chalender *	12P1-M	7100	3/12	11	2.6	1.4	2.8
Fort Valley	11P2	7350	3/13	9	1.3	0.7	2.1
Grand Canyon	11P1	7500	3/12	6	0.9	0.9	1.6

LITTLE COLORADO RIVER

Baldy	9S1	9125	3/10	33	11.0	4.4	8.7 **
Canyon Creek #2	10R7-M	7500	3/11	9	2.0	3.4	2.6 **
Forest Dale	10R6	6430	3/12	2	0.5	T	0.4
Ft. Apache	9R5	9160	3/10	35	10.9	4.4	9.6 **
Fort Valley	11P2	7350	3/13	9	1.3	0.7	2.1
Gentry	10R5	7600	3/11	7	0.9	2.8	2.4 **
Happy Jack *	11R5	7630	3/15	15	3.9	0.0	3.2 **
Heber	10R4	7600	3/11	10	2.4	2.7	2.5 **
McNary	9R2-M	7200	3/12	12	2.4	1.6	1.5
Mormon Lake	11R4	7350	3/12	19	3.5	2.7	4.4
Mormon Mountain	11R3-M	7500	3/12	23	4.5	2.9	6.4 **
Nutriosos	9S4	8500	3/12	6	2.2	0.7	1.4
Snow Bowl #1	11P4	10260	3/14	49	13.0	3.8	---
Snow Bowl #2	11P6	11000	3/14	64	13.8	---	---

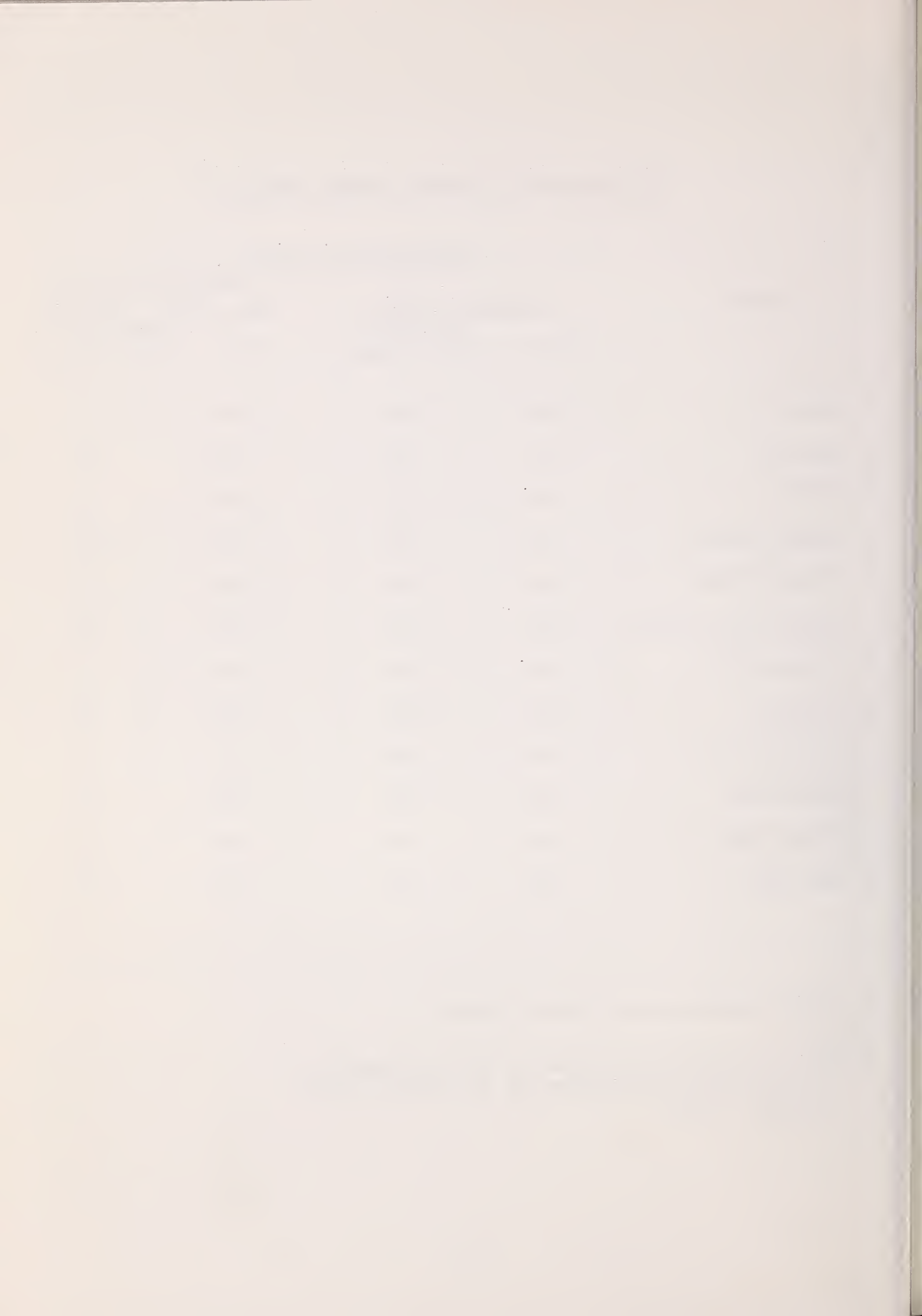
(a) 1948-62, 15 year period. (*) Adjacent drainage. (**) 1948-62 Adjusted Average. (A) Aerial observation: Water content estimated.

PRECIPITATION AT SELECTED ARIZONA STATIONS ^{1/}

STATION	Precipitation (Inches)			
	February - 1965		Current Water-Year (Oct. 1964 - Feb. 1965)	
	Total	Departure from Average	Total	Departure from Average
Alpine	1.87	+ .49	8.03	+ 1.25
Ash Fork	1.12	- .03	4.01	- .76
Clifton	.35	- .56	3.70	- .58
Douglas Smelter	.42	- .17	1.94	- 1.14
Flagstaff WBAS *	2.34	+ .56	9.42	+ 1.64
Payson Ranger Station	2.03	- .16	9.57	+ .51
Phoenix WBAS	.91	+ .06	3.74	+ .36
Prescott	3.32	+ 1.38	8.38	+ .39
Springerville	.78	+ .25	3.75	+ .78
Tucson WBAS	.64	- .20	3.49	- .35
Winslow WBAS	.45	- .03	2.61	+ .16
Yuma WBAS	.38	+ .02	1.49	- .08

* WBAS = Weather Bureau Airport Station

^{1/} Data and Analysis furnished by Paul C. Kangieser,
Arizona State Climatologist, U. S. Weather Bureau,
Phoenix, Arizona



PRECIPITATION

STORAGE GAGE DATA - ABOUT MARCH 15, 1965

Drainage Basin and Storage Gage	Elev.	Current Data		1948-62	From Approx. 11/1 to Date			
		Date of Reading	Mar.1-15 Precip.	Avg. Prec. Mar.1-15	This Year	1948-62 Average	% of Average	
<u>GILA RIVER</u>								
Silver Creek Divide	9000	3/10	.40 (1)	--	14.21	--	---	
Hannagan Meadows	9030	3/13	1.27 (2)	1.69*	15.44	12.22*	126	
<u>SALT RIVER</u>								
Hannagan Meadows	9030	3/13	1.27 (2)	1.69*	15.44	12.22*	126	
Little Wildcat (Heber Snow Course)	7600	3/11	.85 (3)	1.60*	15.61#	12.57*	124	
Maverick Fork	9050	3/10	.20 (4)	1.49*	14.46	10.70*	135	
Workman Creek ^{1/}	6970	3/11	2.35 (5)	1.83	18.79	15.37	122	
<u>VERDE RIVER</u>								
Copper Basin Divide	6720	3/12	2.21 (6)	--	12.17	--	---	
Fort Valley ^{1/}	7350	3/13	1.13 (7)	.92	9.11	8.08	113	
Happy Jack ^{1/}	7480	3/12	2.04 (8)	1.34*	15.32#	10.49*	146	
Mingus Mountain	7660	3/12	1.21 (9)	1.06	11.02	9.06	122	
Mormon Mountain	7500	3/12	2.02 (10)	--	18.30	--	---	
<u>LITTLE COLORADO</u>								
Sheep Crossing (Baldy Snow Course)	9125	3/10	.15 (11)	1.26*	12.77	9.61*	133	
Little Wildcat (Heber Snow Course)	7600	3/11	.85 (3)	1.60*	15.61#	12.57*	124	

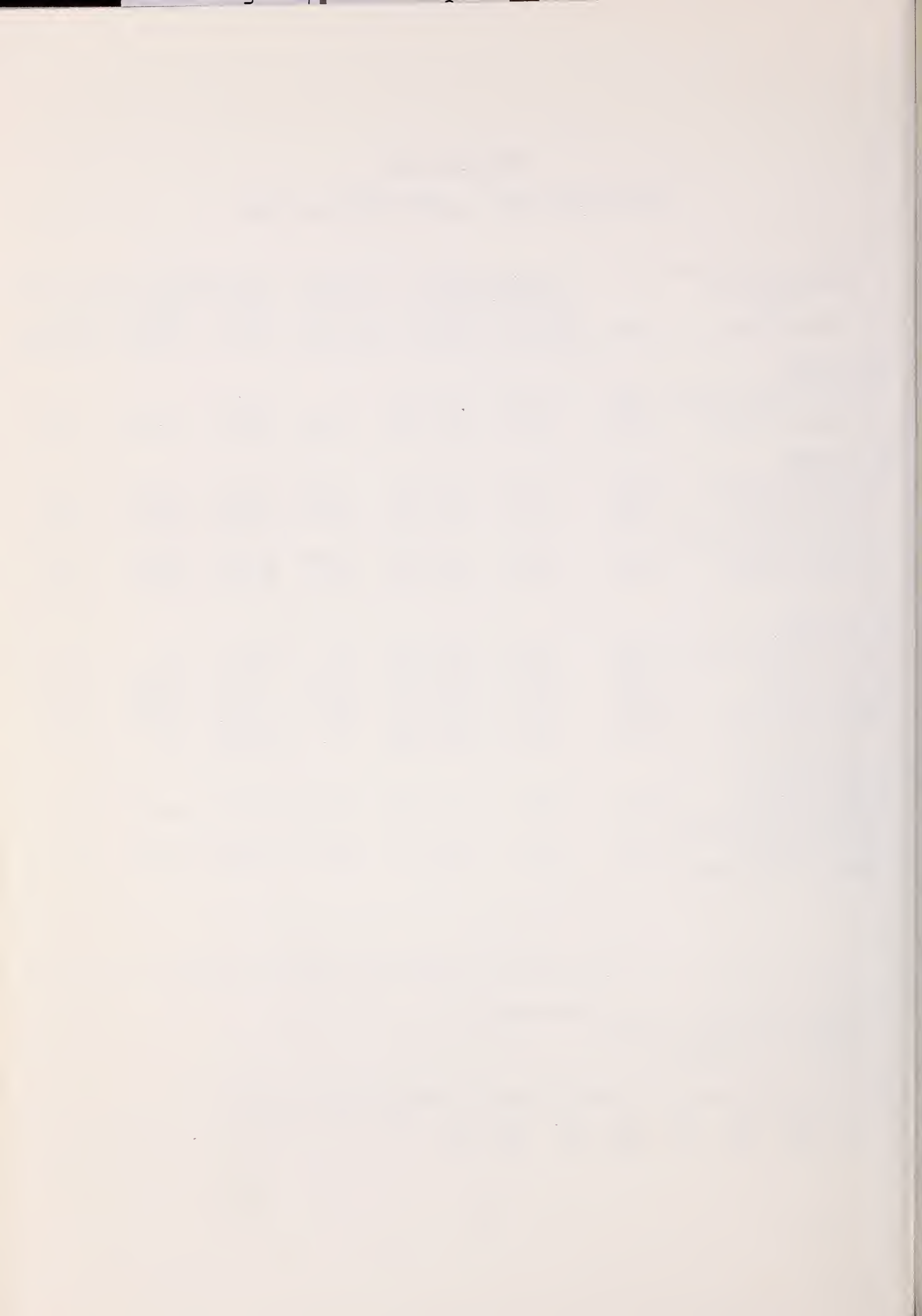
^{1/} Data supplied by U. S. Forest Service

* 1948-62 Adjusted Average

Partially Estimated.

Estimated precipitation received between reading date and 3/15:

(1) .50 (2) .20 (3) 1.50 (4) 1.30 (5) .50 (6) .40 (7) .60
 (8) .60 (9) .50 (10) .70 (11) 1.20



ARIZONA SOIL MOISTURE - ABOUT MARCH 15, 1965

Drainage Basin and Station	<u>1/</u> Station Number	Elev.	Soil Profile in Inches		Soil Moisture Content in Inches				
			Depth	Cap.	Date	1965	Past Record		
							1964	1963	Avg.
<u>GILA RIVER</u>									
Frisco Divide	8S1-M	8000	48	13.3	3/15	11.7	6.1	11.7	11.2
<u>SALT RIVER</u>									
Black River Divide	9S10-*	9100	48	16.8	3/10	17.9	15.1	15.8	15.5
Canyon Creek #2	10R7-M	7500	48	18.3	3/11	14.6	14.4	13.6	14.3
Corduroy Creek	10R8-*	6000	48	16.0	3/10	12.1	7.0	10.9	9.4
McNary	9R2-M	7200	48	16.3	3/9	17.9	13.3	15.4	14.2
<u>VERDE RIVER</u>									
Caener Park	11R2-M	6930	48	19.1	3/12	20.6	11.8	18.3	16.0
Mormon Mountain	11R3-M	7500	48	16.1	3/12	17.7	13.4	17.7	15.1

1/* - Soil Moisture Station only
M - Snow Course and Soil Moisture Station

General Ledger - 1900

Date _____
 Description _____
 Amount _____

1900 Jan 1 Balance _____
 1900 Jan 2 _____

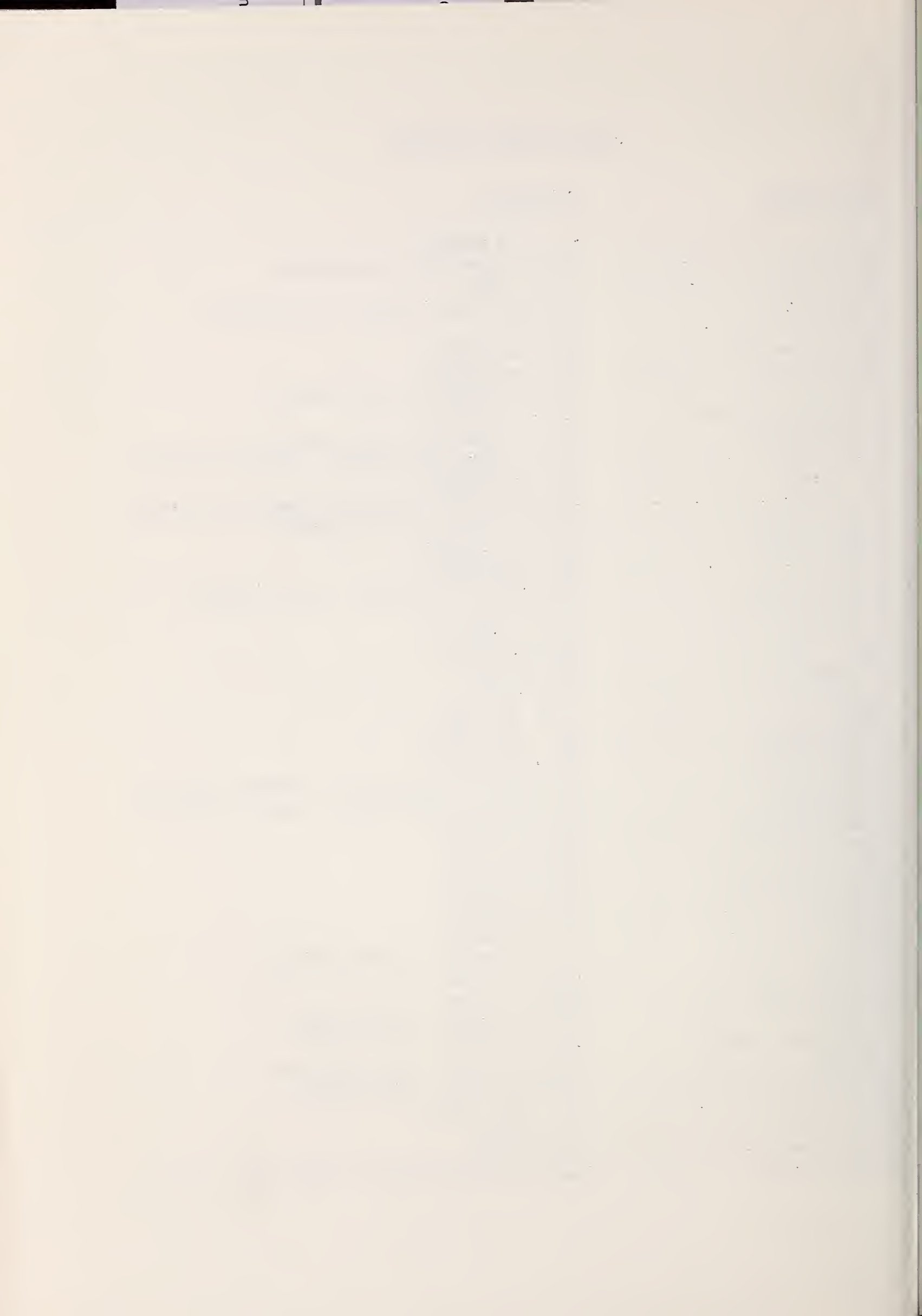
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LIST OF SNOW SURVEYORS

<u>SNOW COURSE</u>	<u>SURVEYOR</u>
Baldy -----	SCS and SRVWUA
Bear Wallow -----	Forest Service - Allan Hinds
Beaver Head -----	N. A. Josh
Bright Angel -----	National Park Service - Vern Ruesch
Camp Wood -----	Lyn Pehl
Canyon Creek #2 -----	SCS and SRVWUA
Casner Park -----	SCS and SRVWUA
Chalender -----	Forest Service - Mel Richards
Copper Basin Divide -----	SCS - Bill Gray
Coronado Trail -----	Forest Service - Larry Soehlig
Forest Dale -----	Fort Apache Reservation - Raymond Endfield
Ft. Apache -----	SCS and SRVWUA
Fort Valley -----	Rocky Mountain Forest & Range Exp. Station
Frisco Divide -----	Forest Service - Joe Clayton
Gaddes Canyon -----	Paul G. Lidbeck
Gentry -----	SCS and SRVWUA
Grand Canyon -----	National Park Service - Larry Hackel
Hannagan Meadows -----	N. A. Josh
Happy Jack -----	Emil O. Ryberg
Heber -----	SCS and SRVWUA
Hummingbird -----	Ray Freeman
Ice King -----	James R. Wray
Inman -----	C. H. McCauley
Iron Springs -----	SCS - Bill Gray
Maverick Fork -----	SCS and SRVWUA
McNary -----	Fort Apache Reservation - Raymond Endfield
Milk Ranch -----	Fort Apache Reservation - Raymond Endfield
Mingus Mountain -----	Paul G. Lidbeck
Mogollon -----	James R. Wray
Mormon Lake -----	SCS and SRVWUA
Mormon Mountain -----	SCS and SRVWUA
Munds Park -----	SCS and SRVWUA
Newman Park -----	SCS and SRVWUA
Nutrioso -----	Forest Service - Larry Soehlig
Pacheta -----	Foch Phillips
Redstone Trail -----	James R. Wray
Rose Canyon -----	Forest Service - Allan Hinds
Silver Creek Divide -----	James R. Wray
Snow Bowl -----	Forest Service - Jay Shoemaker
State Line -----	Forest Service - Joe Clayton
White Spar -----	SCS - Bill Gray
Whitewater -----	Ray Freeman
Willow Ranch -----	Tiny Miller
Workman Creek -----	Rocky Mountain Forest & Range Exp. Station



The Following Organizations Cooperate in the Arizona Snow Survey Work

FEDERAL

Department of Agriculture

Soil Conservation Service

Forest Service

Apache Forest

Coconino Forest

Coronado Forest

Gila Forest

Kaibab Forest

Prescott Forest

Rocky Mountain Forest and Range Experiment Station

Tonto Forest

Department of Commerce

Weather Bureau

Arizona Section

Department of Interior

Bureau of Reclamation

Region III

Geological Survey

Arizona District

Bureau of Indian Affairs

Fort Apache Reservation

San Carlos Irrigation Project

National Park Service

Grand Canyon National Park

Gila Water Commissioner

Safford, Arizona

STATE

Arizona Agricultural Experiment Station

IRRIGATION PROJECTS

Salt River Valley Water Users' Association

Phoenix, Arizona

San Carlos Irrigation and Drainage District

Coolidge, Arizona

PRIVATE

Southwest Forest Industries, Inc.

McNary, Arizona

Other organizations and individuals furnish valuable information for the snow survey reports. Their cooperation is gratefully acknowledged.

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SOIL CONSERVATION SERVICE
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PHOENIX, ARIZONA 85025

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with the Snow Survey"*